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Rhodora

JOURNAL OF THE

NEW ENGLAND BOTANICAL CLUB

Conducted and published for the Club, by

MERRITT LYNDON FERNALD, Editor-in-Chief

CHARLES ALFRED WEATHERBY
LUDLOW GRISCOM
STUART KIMBALL HARRIS
Associate Editors

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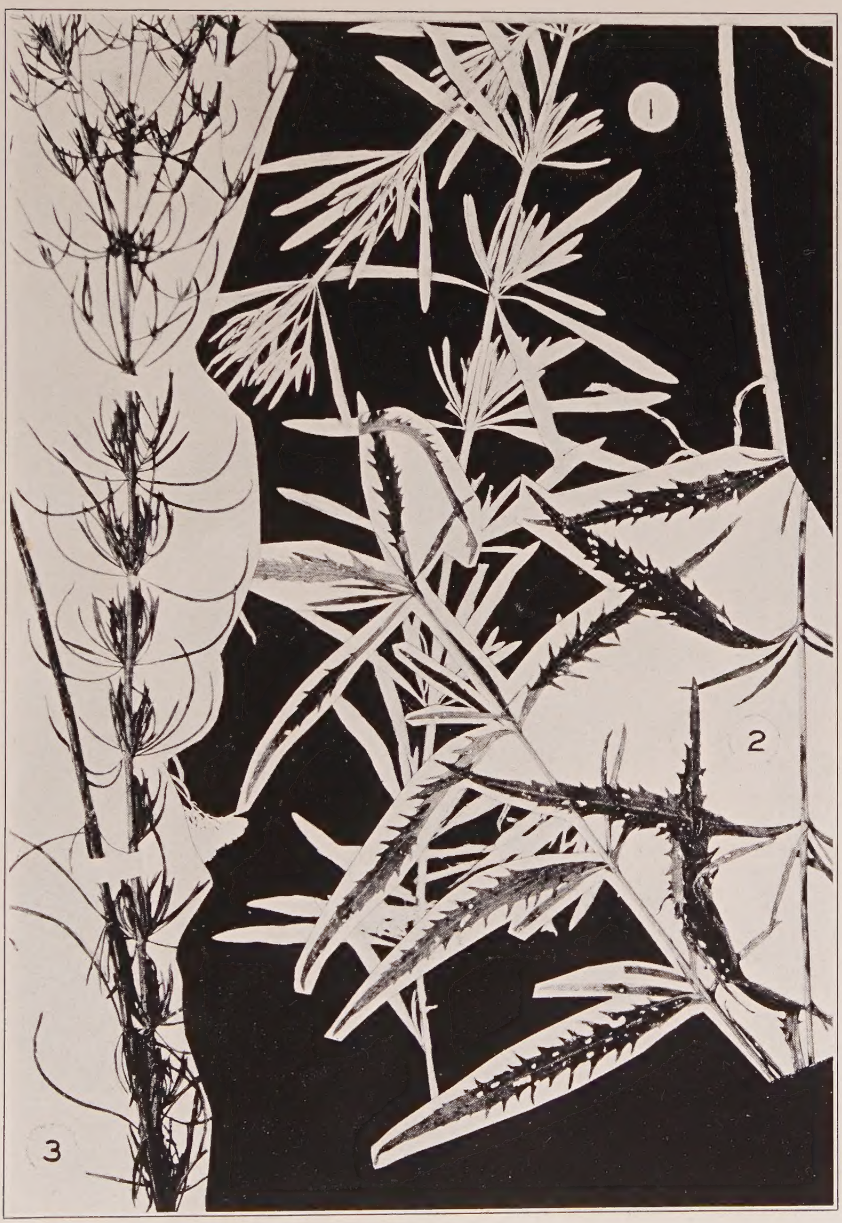
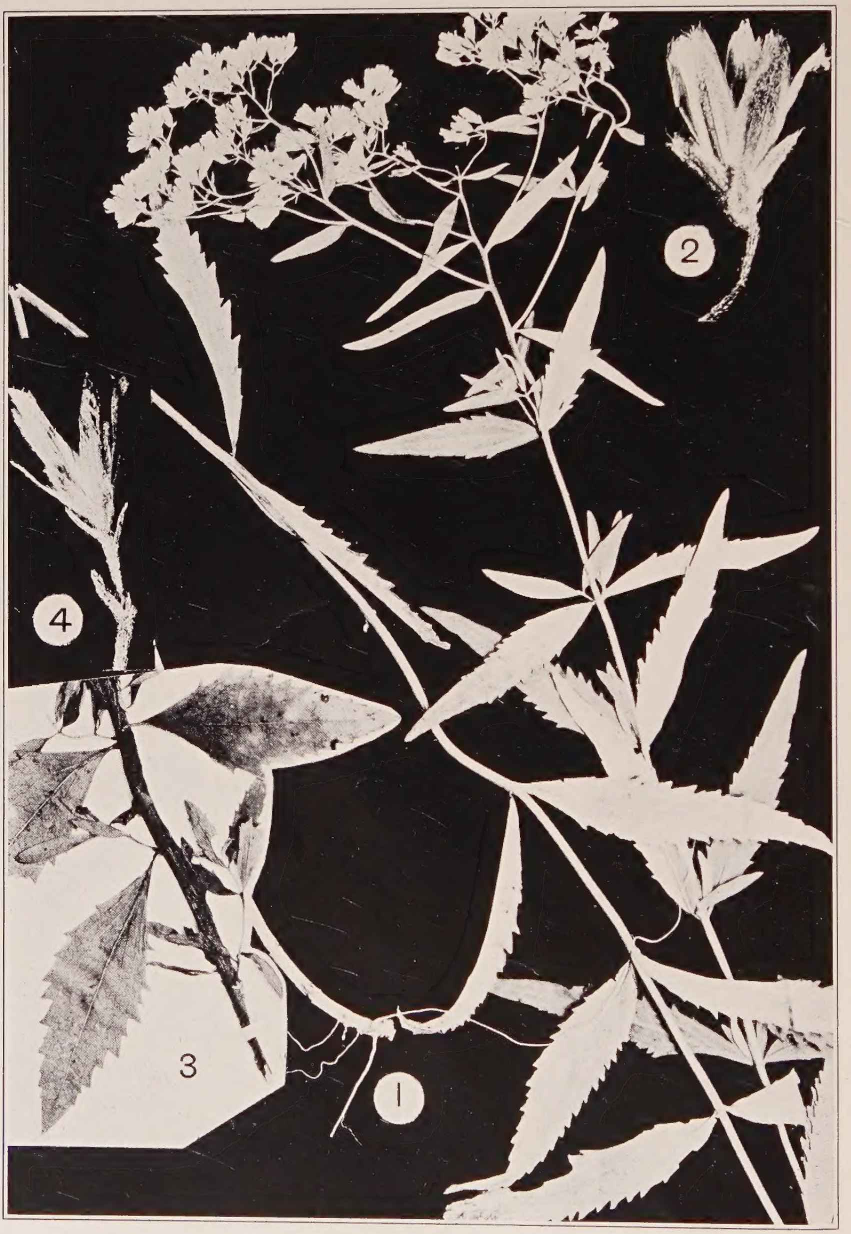


Photo. B. G. Schubert.

EUPATORIUM HYSSOPIFOLIUM: FIG. 1, foliage, × ½. Var. LACINIATUM: FIG. 2, foliage, × ½. Var. LINEARIFOLIUM: FIG. 3, foliage, × ½.



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Eupatorium saltuense: fig. 1, type, × ½; fig. 2, involucre, × 4.
E. anomalum: fig. 3, foliage, × ½; fig. 4, involucre, × 4.

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THE NEW ENGLAND BOTANICAL CLUB

Vol. 44. December, 1942. No. 528.

THE RELATIONSHIP OF LILIUM MICHIGANENSE

EDGAR T. WHERRY

In a recent article in this Journal[1] the characters of two east-American lilies were discussed, with the conclusion "that *L. michiganense* is not a valid species, and that all the plants included therein really belong to *L. superbum.*" Since in his studies of the soil-reaction preferences of native plants the present writer has had no difficulty in distinguishing these two lilies, further discussion seems called for.

Of the 16 characters of possible diagnostic significance considered in the article cited, 12 may be dismissed as having been disposed of, there being either no recognizable differences at all, or such as do occur being of obvious environmental origin. The four which require further attention are: leaf-indument, curvature and coloration of perianth-segments, and anther-length.[2] To these should be added ribbing of perianth-segments. The discussion should moreover be broadened to include the related *L. canadense.*

LEAF-INDUMENT. *Lilium canadense* and *L. michiganense* normally bear tiny spicules on the leaf-margins and on the dorsally projecting veins; only in rare individuals are these reduced to papillae on the veins. On the other hand, *L. superbum* has the margins and veins at most papillose, and often entirely smooth.

---

[1] Hull in RHODORA **44**: 220. 1942.

[2] Some years ago Mills, Proc. Iowa Acad. Sci. **31**: 265. 1926, pointed out the distinctness in these respects of *L. michiganense* as it occurs in Iowa. In the present article his observations are fully confirmed, but considerable additional data are presented.

Curvature of Perianth-Segments. There seems to be general agreement that the curvature in *L. michiganense* is about as strong as in *L. superbum.*

Coloration. The underlying pigment in all three is yellow. *L. canadense* occasionally has this suffused by red, the extreme being known as f. *rubrum* Britton. In *L. michiganense* and *L. superbum* the red coloring is normally abundant, vanishing only in rare mutants.

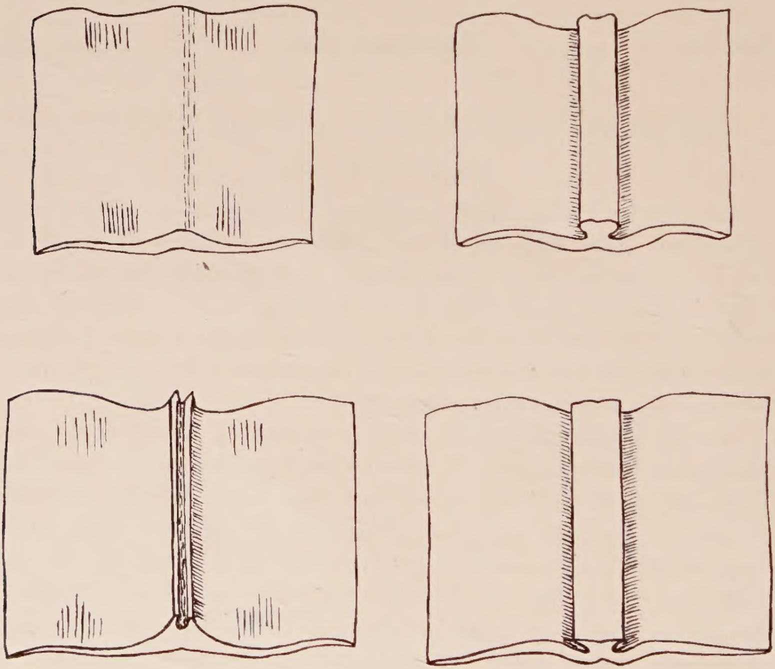

Fig. 1. Sections of sepals and petals × 2: upper, *L. canadense* and *L. michiganense;* lower, *L. superbum.*

At the base of the perianth-segments there is a translucent green zone corresponding to the glandular area the features of which are useful in classifying some other *Liliaceae.* In *L. canadense* and *L. michiganense* this green area is mostly less than 10 mm. long, has rather indistinct margins, and can not be seen when the flowers are viewed face-on. In *L. superbum* it is 10 to 15 mm. long with sharp boundaries, and can easily be seen in the flower-center.

Anther-length. At mid-anthesis the range is 6 to 11 mm. in *L. canadense* and *L. michiganense*, and 12 to 20 mm. in *L. superbum*. While aberrant individuals with decidedly over-size or under-size anthers are occasional, the frequency-plots are normal, with maxima at 8.5 and 16 mm. respectively.

Ribbing of Perianth-Segments. The usefulness of this character does not seem to have been pointed out heretofore. In *L. canadense* the midrib of the sepals is an inconspicuous low rounded ridge; that of the petals is either rounded on the sides or at most bears very narrow horizontal ridges. In *L. superbum* the midrib of the sepals is elevated and bears a pair of erect sharp-edged ridges; that of the petals bears prominent horizontal ridges on its sides. The ribs of *L. michiganense* are of the *canadense* type. This feature is illustrated by the accompanying sketches kindly made by Mr. Hugh E. Stone.

Soil-Reaction Preference. Circumneutral to subacid for *L. canadense* and *L. michiganense;* subacid to mediacid for *L. superbum.*

The following synoptical key will serve to separate normal individuals of these three lilies. The intermediate *L. michiganense* surely does not "belong to *L. superbum*," lying instead close to *L. canadense*. For the purposes of the ecologist, the phytogeographer, and the horticulturist all three should be maintained as distinct (though not necessarily in species status).

Key to Three Entities in the Genus Lilium

Leaves bearing spicules on margins and often on veins dorsally; sepal-midrib low, rounded, inconspicuous; petal-midrib laterally rounded or barely ridged; basal green zone of perianth-segments 5 to 10 mm. long; anthers 6 to 11 mm. long; anthesis early aestival; soil-reaction circumneutral to subacid.
  Recurving of perianth-segments moderate; red pigment varying widely in intensity; range wide.............. *L. canadense.*
  Recurving of perianth-segments strong; red pigment usually copious; range midland................ *L. michiganense.*
Leaves bearing papillae or glabrous on margins and veins; sepal-midrib elevated, bearing two erect sharp ridges; petal-midrib laterally extended into prominent ridges; perianth-segments strongly recurved; red pigment usually copious; basal green zone 10 to 15 mm. long; anthers 12 to 20 mm. long; anthesis late-aestival; soil-reaction subacid to mediacid; range southern and eastern........................ *L. superbum.*

The above discussion is based not only on herbarium work but also on field study of over a hundred plants, in their native habitats and in the extensive garden of Mrs. J. Norman Henry at Gladwyne, Pennsylvania. My thanks are due to Mrs. Henry for pointing out the practical usefulness of the criteria here emphasized.

University of Pennsylvania.

Epipactis latifolia in New Hampshire.—In the late summer of 1942, the writer was invited to accompany Mr. and Mrs. C. A. Weatherby on a botanical collecting trip to New Hampshire and Vermont. On August 23rd the party was exploring a wooded roadside a short distance east of the Connecticut River, in the town of Plainfield, when an orchid was found which at some distance had the appearance of a *Habenaria.* Approaching near enough to see it clearly, Mr. Weatherby at once identified it as *Epipactis latifolia* (L.) All. (*Serapias Helleborine* of Gray's Manual.) Careful search revealed no more than the single individual first seen. It was growing in shaded, fairly rich soil, near the base of a small bank which sloped down from the highway. Contrary to the usual coloration of the flowers as given in descriptions, these were nearly white instead of greenish and showed little madder-purple suffusion.

According to authorities this orchid was probably introduced from Europe in early times, and in the course of years has appeared in eastern Canada, Massachusetts, Pennsylvania and New York. Mr. Charles Schweinfurth has lately reported it also from Missouri and Montana. Neither Mr. Schweinfurth nor Dr. Correll knows of any previous record of the plant for New Hampshire. Mr. Weatherby states: "the species has become established in considerable quantity near Swanton, Vermont, and Pittsfield, Massachusetts." It was found in Hartland, Vermont, just across the river from Plainfield, and also near the river, in 1925 by Mr. E. H. Hazen. This places the species close to the Plainfield station, but its actual occurrence within the boundaries of New Hampshire seems worth recording. It is probably safe to assume that, except for a single collection on trap hills in West Hartford, Connecticut (Mrs. S. M. Monks, 1931), the New Hampshire station is the farthest east so far in New England.

The facts that the species is known in considerable quantity in New England only in the western part, that at Plainfield it grows in alluvium not far from such calcicolous species as *Lobelia Kalmii* and *Parnassia glauca* (*P. caroliniana* of manuals), and that the Hartford trap produces a somewhat basic soil, suggest that the *Epipactis* prefers limy soil and that its distribution may be controlled by this preference. If so, the New Hampshire locality may remain on its easternmost limits.—Alan W. Upham, East Woodstock, Connecticut.

THE SEVENTH CENTURY OF ADDITIONS TO THE FLORA OF VIRGINIA

M. L. Fernald

(*Continued from page 452*)

*Diodia virginiana L., var. **attenuata,** var. nov., planta gracillima; foliis anguste lanceolatis membranaceis basi apiceque valde attenuatis; fructibus subcylindricis 2.5–3.5 mm. diametro; calycis lobis linearibus.—Virginia: open muddy and sandy borders of pools, alluvial bottomlands of Three Creek, Drewryville, Southampton County, September 14, 1941, *Fernald & Long*, no. 13,765 (type in Herb. Gray.; isotype in Herb. Phil. Acad.).

The common and typical *Diodia virginiana* is relatively coarse, with the thick lanceolate to narrowly oblong leaves sessile and only slightly tapering at tip; its fruits are ellipsoid, 3.5–5 mm. in diameter, and crowned by lanceolate calyx-lobes. Var. *attenuata* is slender, relatively weak, with thin or membranaceous narrowly lanceolate leaves attenuate to petiolar bases and to prolonged tips; the slender fruits only 2.5–3.5 mm. broad and crowned by slenderly linear calyx-lobes. It dominates large areas of open muddy and sandy depressions on the bottomlands of Three Creek, where during the summer and autumn of 1940 it was not subject to inundation; nor is it the immediate result of shading, since the open areas of these bottoms are no more shaded than are many other areas where the broader-leaved and thicker-fruited plant abounds. See p. 367.

D. virginiana, forma **hirsuta** (Pursh), stat. nov. *D. hirsuta* Pursh, Fl. i. 106 (1814). *D. virginiana, γ. hirsuta* (Pursh) Torr. & Gray, Fl. ii. 29 (1841).—With no definite range and likely to occur throughout the range of the smoother typical *D. virginiana*, the hirsute plants seem to be a form rather than a true geographic variety.

VIBURNUM RAFINESQUIANUM Schultes. DINWIDDIE COUNTY: a characteristic undershrub in open argillaceous low woods just east of McKenney, nos. 14,024 and 14,421; our first station on the Coastal Plain, the low woodlands occupying a characteristic intrusion of Coastal Plain back into the Piedmont. See p. 373.

*CAMPANULA AMERICANA L., forma **tubuliflora,** f. nov., corollis cylindrico-tubuliformibus ad apicem angustatis clausis rare stylo exserto.—VIRGINIA: seeping calcareous wooded bluffs by James River, west of old Fort Boykin, Isle of Wight County, September 5, 1941, *Fernald & Long*, no. 13,772 (TYPE in Herb. Gray.; ISOTYPE in Herb. Phil. Acad.).—A remarkable aberration, strikingly contradicting the supposed generic character (the rotate corolla) upon which some botanists maintain *Campanula americana* as a separate genus, *Campanulastrum* Small. See p. 362.

LOBELIA ELONGATA Small. NORFOLK COUNTY: fresh reed-marsh and swale along Northwest River near Northwest (the type-area), nos. 14,028 and 14,029, frequently with inflorescences virgate-forking. See p. 369.

DIPSACUS SYLVESTRIS L. ISLE OF WIGHT COUNTY: disturbed soil by James River, below old Fort Boykin, nos. 13,170 and 13,768; the only time we have noted it in Tidewater Virginia.

*ELEPHANTOPUS CAROLINIANUS Willd., forma **vestitus,** f. nov., caule superne ramibusque dense cinereo-tomentulosis hirsutisque, pilis patentibus.—VIRGINIA: low woods, Adams Swamp, south of Baines Hill School, Nansemond County, June 20, 1941 and September 12, 1941, *Fernald & Long*, nos. 13,172 and 13,780 (TYPE in Herb. Gray.; ISOTYPE in Herb. Phil. Acad.). See p. 367.

Typical and common *Elephantopus carolinianus* has only the lower internodes with divergent pubescence, the upper ones and the branches merely with somewhat scattered appressed strigae. Forma *vestitus* is cinereous with short and close pubescence to the summit, the lower and middle internodes heavily tomentulose, the upper ones with close tomentulose pubescence mixed with spreading hairs. Some other collections from Nansemond County are transitional.

NOTES ON EUPATORIUM HYSSOPIFOLIUM (PLATE 737).—*Eupatorium hyssopifolium* L. Sp. Pl. ii. 836 (1753) was clearly described "foliis lanceolato-linearibus trinerviis integerrimis" and two early plates cited: one of *Eupatorium virginianum, folio angusto, floribus albis* of Dillenius (1732); the other of *Eupatoria*

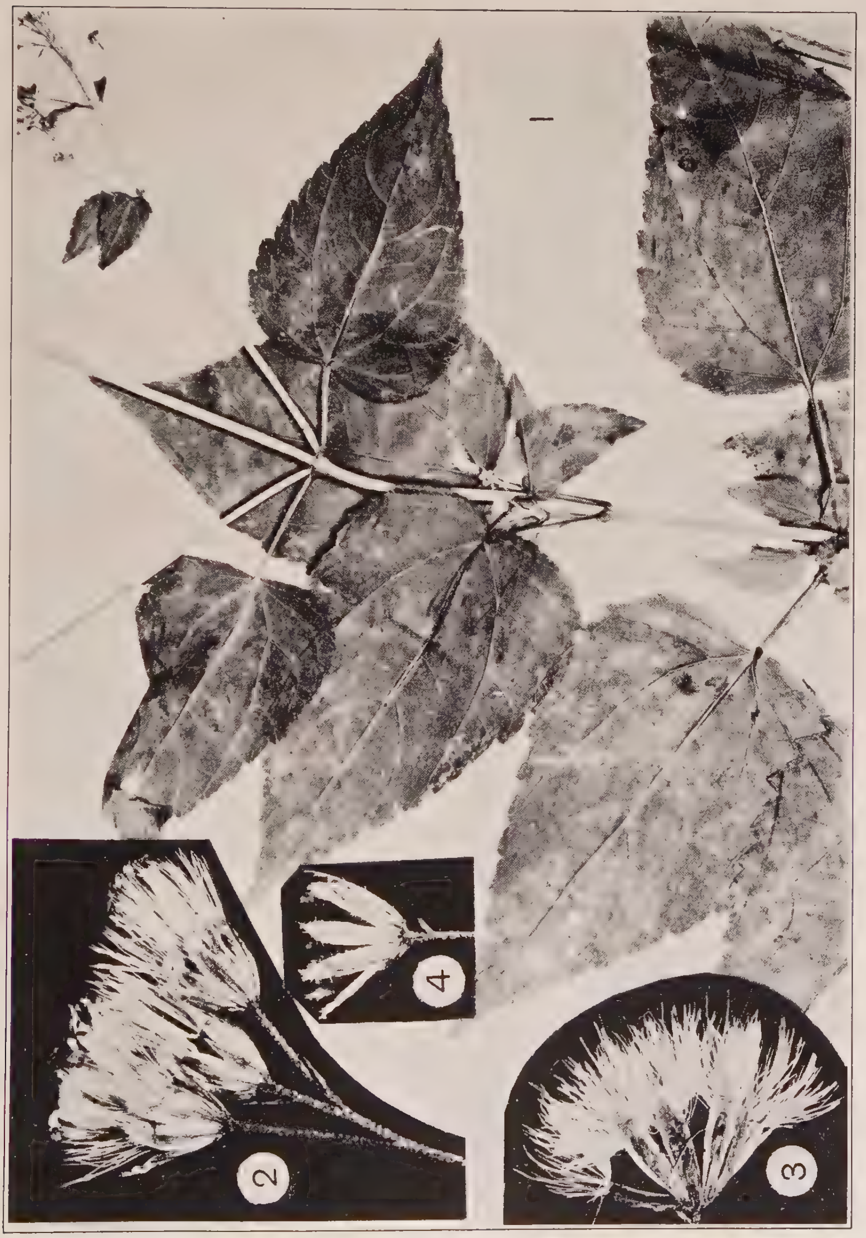

Photo. B. G. Schubert.

EUPATORIUM RUGOSUM, var. CHLOROLEPIS: FIG. 1, foliage, × 1; FIGS. 2–4, heads and involucre, × 4; all from TYPE.

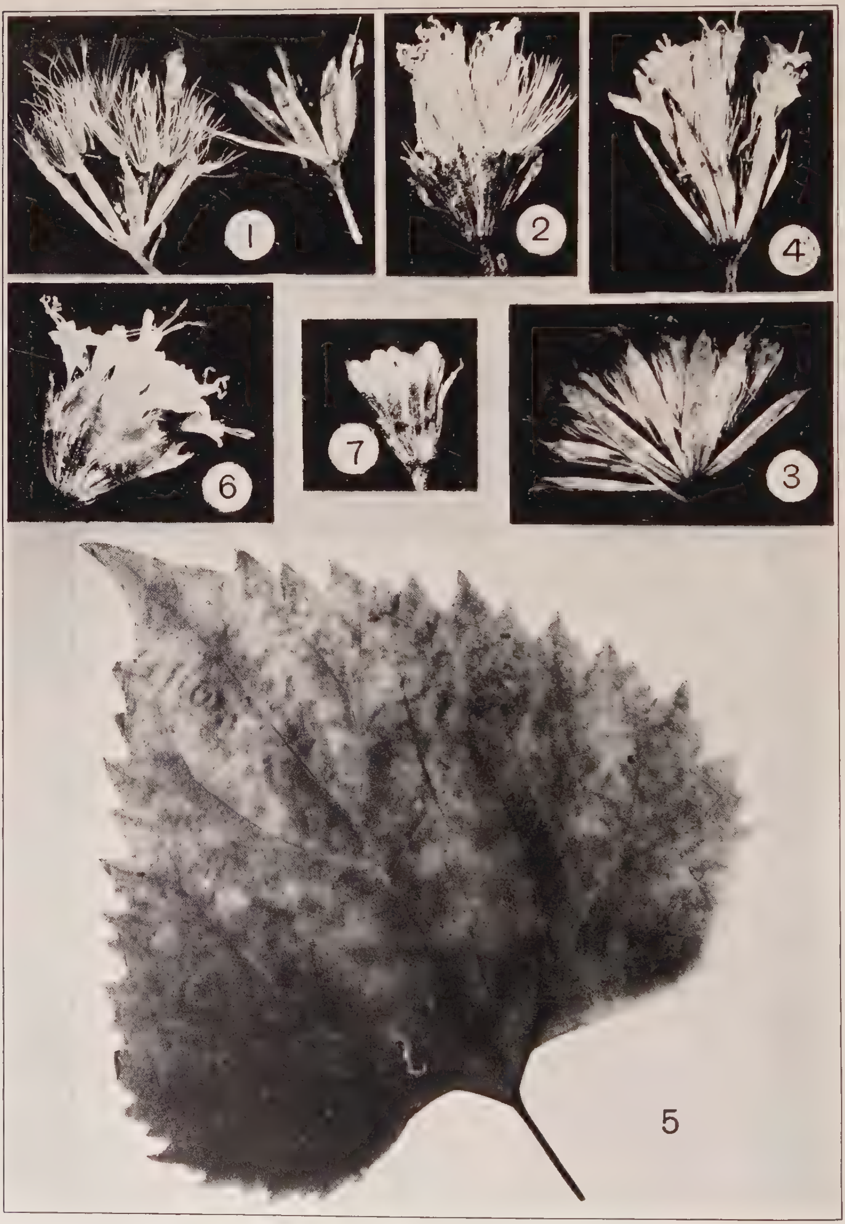

Photo. B. G. Schubert.

Eupatorium rugosum: fig. 1, head and involucre. Var. angustifolium: fig. 2, head. Var. roanense: fig. 3, head. Forma villicaule: fig. 4, head. All × 4. E. Luciae-Brauniae: fig. 5, leaf, × 1; figs. 6 and 7, flowering and budded head, × 4; all from type.

hirsuta, hyssopi foliorum aemula, virginiana of Plukenet (1691), from which Linnaeus obviously drew the name. The figure of Plukenet and the plate of Dillenius are unequivocal. They are of a plant of eastern Virginia (FIG. 1) thence north somewhat locally to southern Rhode Island and south to Alabama, with the lower primary leaves narrowly lanceolate or oblanceolate and entire or slightly toothed, the middle and upper ones entire, the principal ones 5–10 mm. broad. It occurs in moderately dry to damp soils.

This plant passes insensibly into one (FIG. 3), usually much commoner, with all the leaves narrowly linear to linear-oblanceolate, often revolute, mostly quite entire and ranging from 0.5–5 mm. broad, occurring generally north on dry sands and in open pinelands to southeastern Massachusetts, and south to Georgia. This is *E. linearifolium* Walter, Fl. Carol. 199 (1788), clearly described "foliis linearibus integris subverticillatis, calycibus 3 ad 5-floris".

In the other direction typical *Eupatorium hyssopifolium* passes to a plant with all or nearly all the primary leaves serrate to almost laciniate (FIG. 2). The principal primary leaves are lanceolate or linear-lanceolate and 5–17 mm. broad. It occurs in dry to wet soil from Pennsylvania to Kentucky, south to Florida, Alabama and Louisiana. In its most extreme development (with prolonged teeth) it is *E. hyssopifolium*, var. *laciniatum* Gray, Syn. Fl. N. Am. i^2. 98 (1884). The plants with somewhat lower and shorter teeth are *E. Torreyanum* Short in Transylv. Journ. Med. n. 32, viii. 575 (1836).

These three plants, strikingly different in their extremes, so clearly merge that it is most difficult to sort them into exclusive piles. In involucre, corolla and achene they seem to be inseparable, and they all have the consistent habital character, the development of crowded and suppressed branches, forming fascicles in the axils of all but the lowest leaves. Our representation from southeastern Virginia is as follows.

E. HYSSOPIFOLIUM L. (typical). NORTHAMPTON COUNTY: Capeville, no. 5497; Eastville, no. 5496; Bell's Haven, *Fogg*, no. 9728. PRINCESS ANNE COUNTY: Cape Henry, *Killip*, no. 6680; Virginia Beach, nos. 2948, 5064 and 5070; Rosemont, no. 5065; Macon Corners, no. 2949. NORFOLK COUNTY: Great Dismal Swamp, north of Wallaceton, no. 13,795. ISLE OF WIGHT

COUNTY: Bailey's Beach (McKimmie's Wharf), near Rushmere, no. 12,845; west of old Fort Boykin, no. 13,794. SURRY COUNTY: Claremont, no. 12,844. SUSSEX COUNTY: southwest of Lambs, no. 7644. NANSEMOND COUNTY: Kilby, no. 5066. SOUTHAMPTON COUNTY: southwest of Applewhite's Church, no. 11,450.

*Var. LACINIATUM Gray. ELIZABETH CITY COUNTY: west of Hampton, no. 5071. PRINCESS ANNE COUNTY: Dam Neck, no. 4706. NORFOLK COUNTY: Lake Drummond, Great Dismal Swamp, west of Wallaceton, nos. 13,476 and 13,793. ISLE OF WIGHT COUNTY: Cat Pond, south of Benns Church, no. 7642. SOUTHAMPTON COUNTY: moist sandy and peaty shore of Whitefield's Millpond, no. 14,429. PRINCE GEORGE COUNTY: south of Upper Brandon, no. 9165.—These are identified with the TYPE of var. *laciniatum*, which I am designating as the plant of Bedford County, Virginia, September 10, 1871, *A. H. Curtiss*, which, obviously, was the chief basis of Gray's variety. See p. 366.

*Var. **linearifolium** (Walt.), stat. nov. *E. linearifolium* Walt. Fl. Carol. 199 (1788). NORTHAMPTON COUNTY: Eastville, no. 5495. JAMES CITY COUNTY: 1 mile west of Williamsburg, *Grimes*, no. 3190. PRINCESS ANNE COUNTY: Virginia Beach, no. 5067; Rosemont, no. 5068. NORFOLK COUNTY: Northwest, *Heller*, no. 1239. ISLE OF WIGHT COUNTY: south of Lee's Mill, no. 12,840. SURRY COUNTY: Cobham Bay, northwest of Chippokes, no. 12,841; Claremont, no. 12,842.

PLATE 737 is of foliage of the three varieties of EUPATORIUM HYSSOPIFOLIUM, all × ½: FIG. 1, typical E. HYSSOPIFOLIUM from north of Wallaceton, Virginia, *Fernald & Long*, no. 13,795; FIG. 2 of the TYPE of var. LACINIATUM; FIG. 3 of var. LINEARIFOLIUM from Rosemont, Virginia, *Fernald & Long*, no. 5068.

As noted, *Eupatorium hyssopifolium* and its confluent varieties have fascicles of suppressed branches in the axils of all but the lowest leaves. Another plant of southeastern Virginia (PLATE 738, FIGS. 1 and 2), there found in rich, mostly calcareous, woods and thickets, might be considered a very extreme development of *Eupatorium hyssopifolium*, much larger and with broader leaves than in *E. hyssopifolium*, var. *laciniatum*. This calcicolous and broader-leaved plant, however, usually does not develop axillary fascicles, or the axillary branches are few and not fascicled. Instead, it has the habit of *E. altissimum* or of very large *E. leucolepis*, with the involucre of *E. hyssopifolium*. I can relate it closely only to *E. anomalum* Nash, described from Florida but now known from southeastern North Carolina.[1] It so far departs, however, from *E. anomalum* that I am calling it

---

[1] Here I place the material distributed without specific identification from pineland at Fort Fisher on the Lower Cape Fear Peninsula, New Hanover County, North Carolina, *Godfrey*, no. 6193. It is a close match for Nash's type.

*E. **saltuense,** sp. nov. (TAB. 738, FIG. 1 et 2), caule erecto subtereto 0.9–1.4 m. alto superne minutissime hirtello; foliis caulinis 12–14-jugis patentibus vel laxe adscendentibus glabris vel subtus minute hirtellis; primariis lanceolatis acuminato-attenuatis 6.5–11 cm. longis 1.3–2.5 cm. latis serratis, dentibus plerumque 12–15-jugis, basi angustatis sessilibus vel imis breviter petiolatis; corymbo 1.8–3 dm. latis; involucris 6–7 mm. altis, phyllaribus 3-seriatis puberulis obtusis, externis ovato-oblongis, internis oblongis apice scariosis; acheneis 3 mm. longis acute angulatis.—Rich woods, thickets and clearings, southeastern VIRGINIA: thicket back of sand-beach of Cobham Bay, James River, northwest of Chippokes, Surry County, August 25, 1940, *Fernald & Long*, no. 12,846 (TYPE in Herb. Gray.; ISOTYPE in Herb. Phil. Acad.); rich alluvial woods and thickets back of sand-beach of James River, below Sunken Meadow Beach, Surry County, August 23, 1938, *Fernald & Long*, no. 9166; rich calcareous wooded ravine west of Claremont, Surry County, August 23, 1940, *Fernald & Long*, no. 12,847; open pine and oak woods about 3 miles southwest of Waverly, Sussex County, October 20, 1936, *Fernald & Long*, no. 6880; dry sandy woods, thickets and clearings north of Moore's Mill, Sussex County, July 19, 1936, *Fernald & Long*, no. 6413; wooded banks of Appomattox River, Petersburg, Dinwiddie County, September 24, 1939, *Fernald & Long*, no. 11,451; dry woods about 5 miles east of Burgess Station, Dinwiddie County, August 26, 1939, *Fernald & Long*, no. 11,166. See p. 366.

Differing from *Eupatorium hyssopifolium* L. (pl. 737, FIG. 1), its var. *laciniatum* Gray (FIG. 2) and var. *linearifolium* (Walt.) Fernald (FIG. 3) in its broad leaves without crowded axillary fascicles, at most producing few short branches in some of the upper axils. In involucres, flowers and fruits it is very similar to the others; but the habital difference seems to separate it quite definitely from *E. hyssopifolium*. Nearly related to *E. anomalum* Nash, but that more southern species (FIGS. 3 and 4) has relatively short and broad leaves and more tapering and narrower phyllaries, and its heads are on definitely bracted pedicels.

In PLATE 738, FIG. 1 is the TYPE of EUPATORIUM SALTUENSE, × ½; FIG. 2, an involucre, × 4. FIGS. 3 and 4 are of E. ANOMALUM from near Lloyds, Florida, *A. H. Curtiss*, no. 6902; FIG. 3, larger cauline leaves, × ½; FIG. 4, an involucre, × 4.

*E. RECURVANS Small. Extended north from Georgia and southeastern South Carolina. NORFOLK COUNTY: damp old clearings and thickets, eastern side of Great Dismal Swamp, north of Wallaceton, no. 13,796; wet sandy and peaty shore near entrance to the Feeder Ditch, Lake Drummond, Great Dismal Swamp, no. 13,797; similar habitat, near entrance to Portsmouth Ditch, Lake Drummond, nos. 13,798 and 13,799. Surry County: open clearing, Hog Island, no. 12,843 (leaves not recurved, but with shape and size as well as with the involucre of *E. recurvans*). See p. 366.

E. tortifolium Chapm. Range extended westward into Southampton County: dry sandy pine and oak woods 6 to 7 miles south of Franklin, no. 8867.

E. sessilifolium L., var. Vaseyi (Porter) Fern. & Grisc. Range extended to Surry County: woods and thickets back of sand-beach of James River, Claremont, no. 13,792.

E. rugosum Houtt. (*E. urticaefolium* Reichard). To the few recorded stations in the southeastern tidewater counties add the following. Sussex County: rich woods, Moore's Mill, no. 7647; dry woods by Nottoway River, Green Church Bridge, northwest of Owen's Store, no. 14,032. Greensville County: rich wooded slope just above the "fall-line" by Three Creek, northwest of Emporia, no. 14,031. Plate 740, fig. 1.

*E. rugosum Houtt., var. **roanense** (Small), stat. nov. *E. roanense* (as "*roanensis*") Small, Man. Se. Fl. 1326 (1933). Craig County: Potts Mts., alt. 910 m. *Steele & Steele*, no. 118.—Although Small described his *E. roanense* only from Roan Mt. in western North Carolina and eastern Tennessee, with "bracts somewhat spatulate" (see plate 740, fig. 3), this characteristic extreme follows the mountains from Potts Mountains (separating Craig County, Virginia, from Monroe County, West Virginia) to northwestern Georgia (*Ravenel* in Gray Herb.).

*E. rugosum Houtt., var. **chlorolepis**, var. nov. (tab. 739), foliis primariis late ovatis acuminatis basi rotundatis vel subcordatis utrinque strigoso-setulosis 5–10 cm. longis 3–6.5 cm. latis; involucris 4–5.5 mm. longis, phyllaribus herbaceis viridiscentibus oblongis vel late linearibus valde nervosis.—Surry County, Virginia: woods and thickets back of sand-beach of James River, and rich calcareous wooded ravines along the James, Claremont, September 7, 1941, *Fernald & Long*, nos. 13,784 and 13,785, October 10, 1941, *Fernald & Long*, no. 14,034 (type in Herb. Gray., isotype in Herb. Phil. Acad.). See pp. 363 and 371. In plate 739 all figures are from the type, fig. 1, summit of stem, × 1, figs. 2–4, heads and involucre × 4.

Characterized by its broad and herbaceous phyllaries (figs. 2–4), much broader than the linear-attenuate scarious ones (pl. 740, fig. 1) of typical *Eupatorium rugosum*. Although the wide-spread *E. rugosum* may have the leaves as small as in var. *chlorolepis*, they are usually much larger (up to 1.8 dm. long and

1.1 dm. broad), generally smoother and only rarely subcordate. The broad and strongly costate phyllaries, green and herbaceous except for the short scarious tip, at once mark the variety. In a region (the very rich calcareous slopes to the James) which is famous for the great size of foliage of most species we should expect *E. rugosum* to have large leaves, for, in much less favorable spots in the southeastern counties the thin and smooth noncordate leaves of typical *E. rugosum* are 8–15 cm. long and up to 10 cm. broad. The involucre of var. *chlorolepis* suggests that (FIG. 2) of the southwestern var. *angustatum* (Gray) Blake (Arkansas, Louisiana and Texas), but the phyllaries are more corrugated and the ovate leaves rounded to subcordate at base, whereas in var. *angustatum* they are very narrowly ovate to broadly lanceolate, with strongly tapering bases. In width of phyllaries var. *chlorolepis* is comparable with var. *roanense* (noted above); but that characteristic variety of the Blue Ridge or of the Alleghenies, from the borders of Virginia and West Virginia to Georgia and Tennessee, has very full heads, with the phyllaries (FIG. 3) dilated upward and with broadly scarious margins.

The plant with villous stems and petioles described by me as *Eupatorium urticaefolium*, var. *villicaule* is only a trivial form,[1] rather than a true geographic variety. Its involucre (FIG. 4) is that of typical *E. rugosum* and its foliage is characteristic of typical *E. rugosum*. FIG. 4 is from the type.

Of close affinity to *Eupatorium rugosum* is the very local species of Whitley County, Kentucky, *E. Luciae-Brauniae*[2]; but the cordate-deltoid leaves (FIG. 5) and the tiny involucres (FIGS. 6 and 7) with caudate-tipped phyllaries mark that little known plant.

In PLATE 740 the involucres and heads are all × 4, the leaf × 1. FIG. 1 shows a fruiting head and a separated involucre of EUPATORIUM RUGOSUM from northwest of Emporia, *Fernald & Long*, no. 14,031; FIG. 2, a flowering head from the TYPE of var. ANGUSTATUM; FIG. 3, a flowering head of var. ROANENSE from Highlands, North Carolina, *Harbison*, no. 1105; FIG. 4, from TYPE of forma VILLICAULE.

FIGS. 5–7 are from the TYPE of E. LUCIAE-BRAUNIAE, a characteristic leaf, a flowering head (FIG. 6) and a younger head (FIG. 7).

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[1] EUPATORIUM RUGOSUM Houtt., forma **villicaule** (Fernald), stat. nov. *E. urticaefolium*, var. *villicaule* Fernald in RHODORA, x. 87 (1908). *E. rugosum*, var. *villicaule* (Fernald) Blake in RHODORA, xliii. 558 (1941).

[2] **E. Luciae-Brauniae**, nom. nov. *E. deltoides* E. L. Braun in RHODORA, xlii. 50 (1940), not *E. deltoideum* Jacq. (1798) nor Poepp. ex Spreng. (1826).

Carphephorus bellidifolius (Michx.) T. & G. Two range extensions northward. Isle of Wight County: dry sandy woods northwest of Raynor, no. 13,471. Southampton County: dry sandy oak woods southwest of Applewhite's Church, no. 13,782.

Chrysopsis graminifolia and Allies in Virginia and the Carolinas (Plates 741–744).—The characteristic series of plants of sands of the Coastal Plain and sands or silicious rocks of adjacent provinces, which, in the aggregate, passes as *Chrysopsis graminifolia* (Michx.) Ell., is very complex. By early American authors treated as a single variable species, it seems to consist of a considerable number of localized trends, comparable with those in *Aster*, *Solidago* and *Antennaria*. By Small it was treated in his Flora of the Southeastern United States, 1181 and 1182 (1903) as 9 species. Some of the latter, *C. flexuosa* Nash, *C. latifolia* (Fernald) Small, *C. Ruthii* Small, *C. oligantha* Chapm., *C. microcephala* Small and, perhaps, *C. Tracyi* Small, are sufficiently definite as to stand as local species. There are apparently others to be differentiated in the most southern States. These I am not attempting to deal with; but the splendid series from eastern North and South Carolina assembled by Mr. Robert K. Godfrey and the recent series from eastern Virginia gives evidence that, whereas the elongate basal leaves are essentially alike in all these plants, there are very real differences in habit and involucres.

Although in 1903 and again in 1913 (his Fl. ed. 2) Small considered these plants of the *Chrysopsis graminifolia* series to be members of *Chrysopsis*, in his Manual (1933) he removed them to *Pityopsis* and divided this hardly worth-while genus into three series of species, two of which, his "II. *Graminifoliae*" and "III. *Asperae*", are well represented in Virginia and the Carolinas. *Pityopsis*, series *Graminifoliae* he characterized, "Peduncles, branches and stem woolly-tomentose", the *Asperae* having "Peduncles, branches, and sometimes the stem, glandular". Under the *Asperae* the only species in Small's treatment which concerns us is *P. aspera* (Shuttleworth) Small, with "outer bracts of the involucre . . . glandular". Desperately floundering in the complexities of the group and trying to match the plant of eastern Virginia with relatively short and glabrate or glabrous but stipitate-glandular involucre, in 1937 (Rhodora,

xxxix. 455) I called it *C. graminifolia*, var. *aspera* (Shuttleworth) Gray, in contradistinction to the plants with glandless and pilose or lanate involucres which, following Small, I then called *C. graminifolia*.

Shuttleworth seems never to have published *Chrysopsis aspera*. The binomial first appeared as the synonymic basis for *C. graminifolia*, var. *aspera* Gray, Syn. Fl. N. Am. i^2. 121 (1884), Gray defining an all-inclusive *C. graminifolia* (Michx.) Ell. as "silvery sericeous", with "bracts [phyllaries] many-ranked, glabrate, sometimes granulose-glandular on back; peduncles when glabrate, often hirtellous-glandular", and of this "silvery-sericeous" plant he proposed

> "**Var. áspera** (*C. aspera*, Shuttlew. in distrib. coll. Rugel), a glabrate rigid and polycephalous state, near St. Marks, Florida (probably on the very coast), the stem and leaves sparsely glandular-hispidulous."

Just what Gray had as var. *aspera* I am unable to say, no plant so named by him being now in the Gray Herbarium, although a *Rugel* specimen from Florida, received since Gray's death, sufficiently matches his description. It is apparently a trivial state of the plant with copiously glandular involucre. The specific or, with Small, serial character "Peduncles . . . glandular", as opposed to "Peduncles . . . woolly-tomentose", too often breaks: for instance, a single specimen of *C. nervosa* (Willd.) Fern. (*C. argentea* (Pers.) Ell.) from Northampton County, Virginia (*Fernald, Long & Fogg*, no. 5503), has 2 large heads, with glandless involucres, but one head is on a silky-pilose almost glandless peduncle, the other with the peduncle copiously stipitate-glandular. Most commonly, however, when stipitate glands abound on the peduncles they are equally abundant on the involucres; but some plants, in general quite like ordinary small-headed *C. aspera*, have the involucres with no stipitate glands, or a few only on the lowest phyllaries.

Incidentally, if, before taking up *Chrysopsis aspera* as a species, Small had consulted the original description of *Inula graminifolia* Michx. Fl. Bor.-Am. ii. 122 (1803), the basis of *C. graminifolia* (Michx.) Ell. Sk. ii. 334 (1824), he would have found that it was clearly described "calycibus turbinatis; squamis numerosis, acutissimis, superne glandulosis . . . *Hab.* a Carolina ad Floridam, frequens". Small defines *C. aspera* with "outer bracts of the involucre lanceolate, glandular". The difference is not evident. Persoon, working with Michaux's collections in 1806, maintained *Inula graminifolia*, "argenteo-sericea, . . . fol. lanceolato-linearib. nervosis, . . . squamis acutissimis medio glandulosis . . . Cal. parvuli Conyzae, carina serrato-glandulosa", and, immediately following, described as a new species, presumably found in Michaux's material,

> "*Inula argentea*, sericea, fol. lanceolatis trinerviis erectis flexuosis, corymb. subcomposito stricto. Hab. in Pennsylvania. Color pl. argenteo-virens. Fol. lanceolato-acuminata, cauli subappressa. Antecedenti colore et foliis similis, sed flor. multo majores, squamae calycin applantae, pubescentes".—Pers. Syn. ii. 462 (1806).

Inula argentea is, evidently, the common, usually nonglandular plant (PLATE 743, FIG. 3 and PL. 744, FIG. 3) which follows the sands northward to Delaware; and when Nuttall placed *I. graminifolia* Michx. and *I. argentea* Pers. in his subgenus *Chrysopsis* in his Gen. ii. 151 (1818), he explicitly defined *I. graminifolia* with "calix . . . glandularly pubescent" while *I. argentea* had "calix . . . pubescent, not glandular". Nuttall apparently erred, however, in placing *Erigeron nervosum* Willd. under *I. graminifolia* and there is apparently no justification for his citing the plant with glandular involucre from Delaware, where *I. argentea* alone is known. Nuttall gave for *I. graminifolia* (glandular involucre) the range "Delaware to Florida", for the glandless *I. argentea* "Virginia to Florida".

As to *Erigeron nervosum* Willd. Sp. iii^3. 1953 (1803), with "*Habitat in* America *boreali*", his description was rather detailed:

> "*5. ERIGERON *nervosum*. W.
>
> E. foliis lineari-lanceolatis integerrimis sericeis, nervosis, floribus paniculatis. W.
>
> Nerviges Berusungskraut. W.
>
> *Habitat in* America *boreali*. ♃ (v. s.).
>
> Caulis *erectus simplex albo-tomentosus*. Folia *alterna inferiora quadripollicaria, summa semipollicaria et breviora, stricta rigida, lineari-lanceolata acuta integerrima . . . nervosa viridia, subtus pilis sericeis adspersis albidis obsita*. Panicula *terminalibus simplex, pedunculis tomentosis*. Calyx *imbricatus, squamis oblongis*. Corolla *non vidi*. Pappus *rufescens pilosus*. W."[1]

Willdenow said nothing about glands on the involucre. His

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[1] This unusually full description was characterized by E. L. Greene in Erythea, ii. 93 (1894) as "worse than a *nomen nudum*, and that specific name should therefore be allowed to remain unemployed."

Erigeron nervosum was, with scarcely a doubt, the commonest coastwise species of eastern America, *Chrysopsis argentea* (Pers.) Ell. (PL. 743, FIG. 3, and 744, FIG. 3).

As pointed out to me by Mr. Robert K. Godfrey, when he was tentatively working over his Carolina collections, *Chrysopsis microcephala* lacks the prolonged and horizontal stolons which are found in carefully collected *C. nervosa*. This character seems to be a fundamental one, just as it is in *Antennaria*. One series is cespitose or subcespitose, with the erect new leafy basal offshoots close to the flowering stem or merely on very short and promptly assurgent offshoots; the other series, although sometimes with approximate erect leafy tufts, generally produces prolonged and flagelliform stolons (see PL. 744, FIG. 1), these eventually terminated by the characteristic basal rosettes from which, the following season, new flowering stems arise. In carefully collected material this difference in the vegetative habit is striking; in merely "grabbed" (not "grubbed") specimens the inconclusive identifications have to be by matching specimens. The character, glandular or nonglandular involucre, etc., is, it would seem, less fundamental. True *C. graminifolia* (*C. aspera*) PL. 742, FIG. 3, with abundant stipitate glands on the involucre, passes into a state habitally quite like it but with the glands nearly obsolete; and, under the silky tomentum, the involucres of *C. nervosa* may sometimes show abundant but minute viscid trichomes or glands.

Returning to the division of the series on habit, the specimens in the Gray Herbarium give the following results. To the series with cespitose or subcespitose habit belong *C. graminifolia* (*aspera*), PL. 742, FIG. 3, *C. microcephala*, PL. 741, FIG. 3, *C. Correllii* (see below), PL. 741, FIGS. 1 and 2, and *C. latifolia;* to the series with flagelliform stolons *C. nervosa* (*C. graminifolia* of authors and *C. argentea*), PL. 743, FIG. 3 and 744, FIG. 3, *C. Tracyi* (too near the last), *C. oligantha* and *C. adenolepis* (see below), PL. 742, FIGS. 1 and 2. *C. Ruthii* and *C. flexuosa*, with subequal and loosely spreading cauline leaves, are not habitally like the others. Within these two series there are parallel tendencies. The species with involucres glandular but otherwise glabrous have the leaves of the peduncles few and scattered; those with the involucres pilose to silky-lanate have the equally pubescent leaves of the peduncles very numerous and imbricated, so that they and the lowest phyllaries seem confluent.

Upon these characters I am grouping the species of the *graminifolia* series in Virginia and the Carolinas as follows, it being clearly understood that, when types of Michaux, Persoon, Willdenow and some others are available again, the applications of some names may necessarily change.

a. Plants cespitose or tufted, the basal offsets erect or at most short and promptly assurgent stolons....*b.*

  b. Involucre glabrous or essentially so at base, 6–10 mm. high (to tips of inner phyllaries); phyllaries and peduncles stipitate-glandular or glutinous, the phyllaries not conspicuously merging into the few scattered leaves of the peduncle....................................1. *C. graminifolia.*

  b. Involucre silky-lanate at least at base, the outer phyllaries and the abundant and imbricated upper leaves of the peduncles intergrading.

    Involucre (to tips of inner phyllaries) 5–8 mm. long, at first mostly heavily lanate at base; principal phyllaries oblong-lanceolate, the inner with broad pale chartaceous margins; new heads well formed at expanding of the earlier ones............................2. *C. microcephala.*

    Involucre 8–13 mm. long, only sparsely lanate; phyllaries linear and herbaceous except for the very narrow margins; first heads greatly overtopped by stiffly ascending branches and branchlets terminated by undeveloped heads..................................3. *C. Correllii.*

a. Plants with prolonged flagelliform or filiform prostrate stolons and eventual slender rhizomes.

  Involucre glabrous or nearly so except for the glandular phyllaries; the outer gland-bearing phyllaries not merging into the scattered upper leaves of the peduncles.4. *C. adenolepis.*

  Involucre pilose to silky-lanate, glands if present partly hidden or inconspicuous, outer phyllaries gradually merging into the often imbricated leaves of the peduncles.

    Principal phyllaries broadly linear to linear-lanceolate or narrowly oblong, 1–1.4 mm. broad, chartaceous except for green midrib.

      Inflorescence a loose and open corymbiform panicle, with elongate slender branches...................5. *C. nervosa.*

      Inflorescence a slender cylindric thyrsiform panicle with abbreviated erect branches..........5a. *C. nervosa*, var. *virgata.*

    Principal phyllaries narrowly linear, 0.6–1 mm. broad, strongly herbaceous except for very narrow scarious margins..........................5b. *C. nervosa*, var. *stenolepis.*

1. C. GRAMINIFOLIA (Michx.) Ell. Sk. ii. 334 (1824); DC. Prodr. v. 326 (1836); Bertol. Misc. Bot. vii. 33, t. 3 (1848), Bertoloni's plate being excellent, his description accurate: "Fibrae radicales e rhizomate brevissimo ortae . . . Folia . . . radicalia caespitosa, . . . Pedunculi monocephali, foliis exiguis, paucis instructi, glandulisque stipitellatis adspersi. Calathus imbricatus, squamis lanceolato-linearibus, acutis,

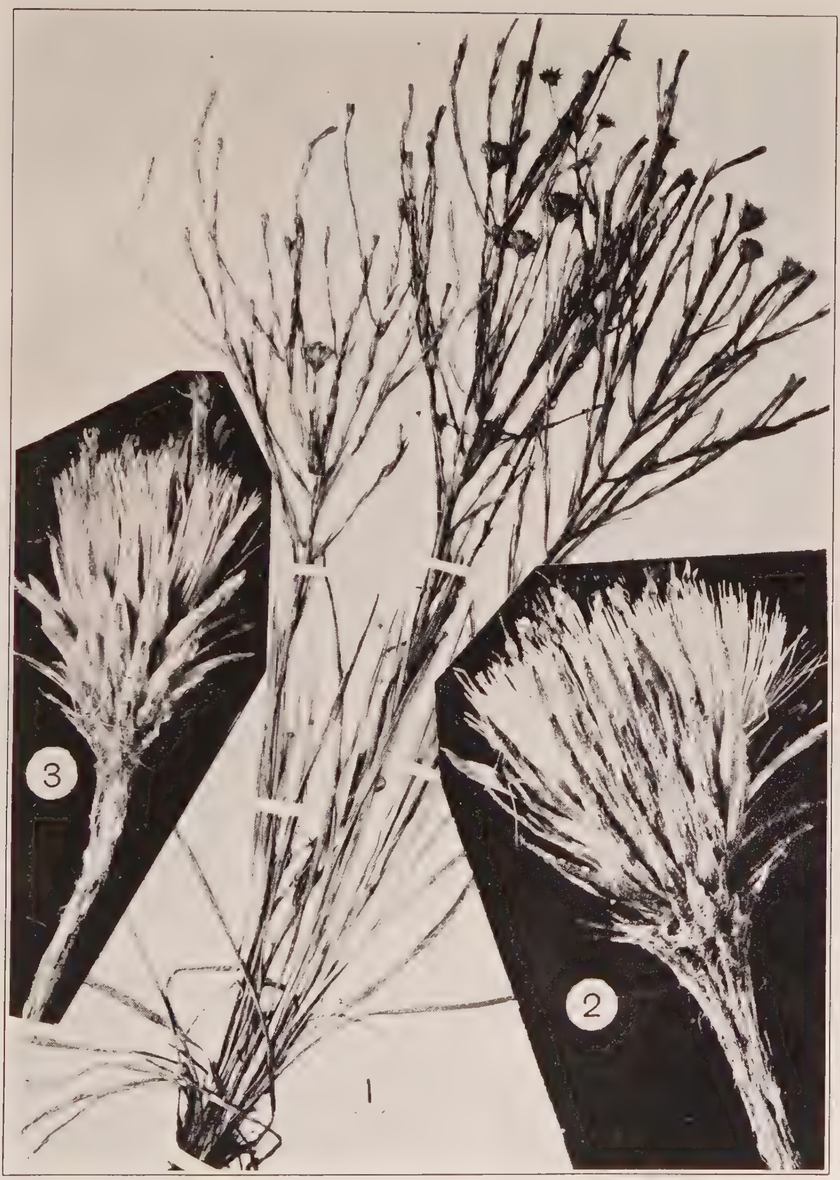


Photo. B. G. Schubert.

CHRYSOPSIS CORRELLII: FIG. 1, TYPE, × 2/5; FIG. 2, head, × 4. C. MICROCEPHALA: FIG. 3, head, × 4.

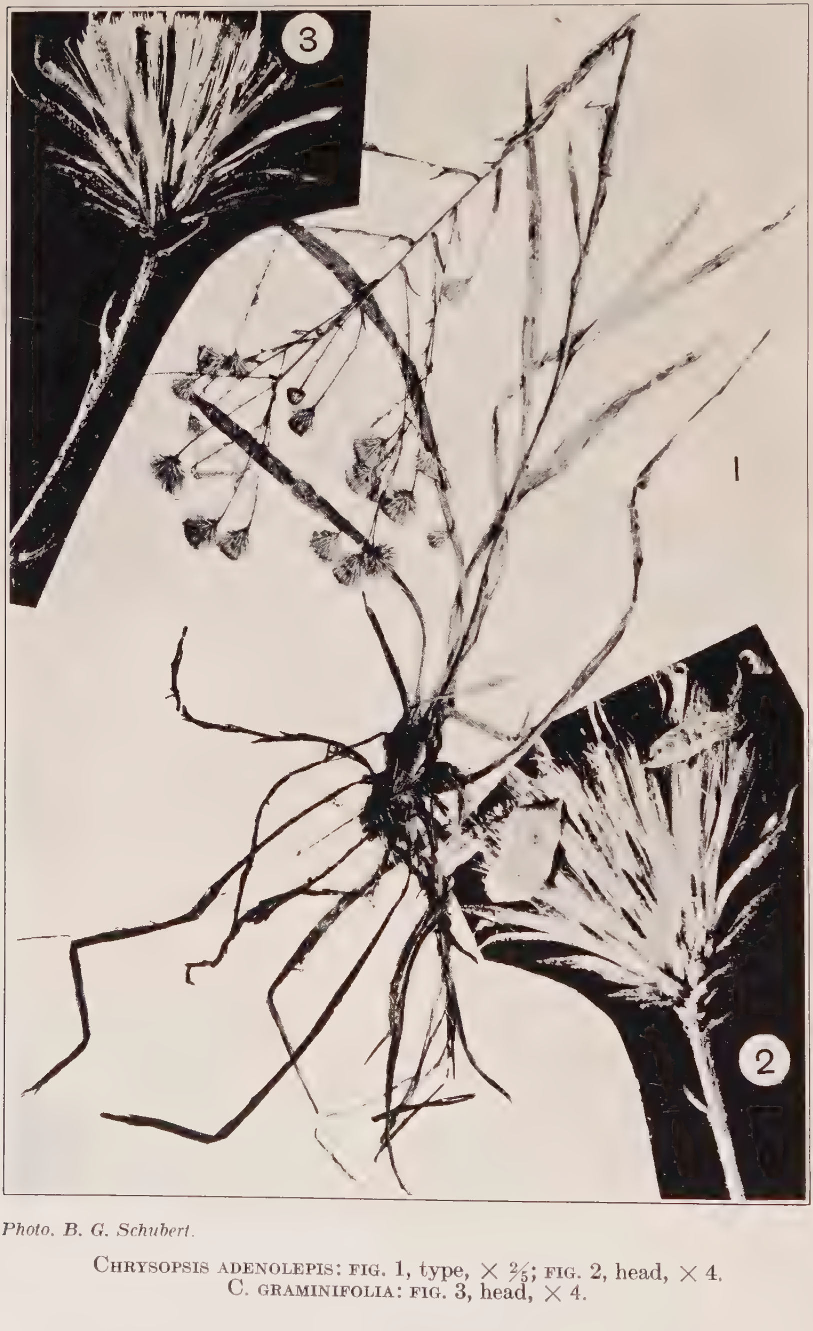


Photo. B. G. Schubert.

CHRYSOPSIS ADENOLEPIS: FIG. 1, type, × ⅖; FIG. 2, head, × 4.
C. GRAMINIFOLIA: FIG. 3, head, × 4.

dorso hirtis glandulis stipitellatis". *Inula graminifolia* Michx. Fl. Bor.-Am. ii. 122 (1803); Nutt. Gen. ii. 151 (1818). *Erigeron glandulosus* Poiret in Lam. Encycl. Meth. viii. 487 (1808), not Walt. *Diplopappus graminifolius* (Michx.) Less. in Linnaea, v. 144 (1830) at least as to basinym. *Pityopsis graminifolia* (Michx.) Nutt. in Trans. Am. Phil. Soc. n. s. vii. 317 (1841). *C. aspera* Shuttlew. ex Gray, Syn. Fl. N. Am. i^2. 121 (1884) in synonymy; Small, Fl. Se. U. S. 1182 (1903). *C. graminifolia*, var. *aspera* (Shuttlew.) Gray, Syn. Fl. N. Am. 1^2. 121 (1884). *Pityopsis aspera* (Shuttlew.) Small, Man. Se. Fl. 1341 (1933).—Siliceous or argillaceous pine or oak woods and openings, northern Florida to Mississippi, north to Virginia. The following selected from a large representation, are characteristic. VIRGINIA: Bowling Green, Caroline County, *Fernald & Long*, no. 9174; Urbanna, Middlesex County, *Hermann*, no. 10,425; 3 miles north of Williamsburg, James City County, *Menzel*, no. 119; Campus, University of Richmond, Henrico County, *M. Ryland;* Chester, Chesterfield County, *Smith & Hodgdon* in Pl. Exsicc. Gray, no. 889; headwaters of Blackwater River, Prince George County, *Fernald & Long*, no. 6711; Gary Church, Prince George County, *Fernald & Long*, no. 6712; Disputanta, Prince George County, *Fernald & Long*, no. 6418. NORTH CAROLINA: Middlesex, Nash County, *Godfrey*, no. 5430; Oxford, Granville County, *Godfrey*, no. 5533; Raleigh, Wake County, *Biltmore Herb.*, no. 1955a; Reidsville, Rockingham County, *Godfrey*, no. 6108; Greensboro, Guilford County, *Wm. Rhoades;* Winston-Salem, Forsyth County, *Schallert;* Sanford, Lee County, *Godfrey*, no. 6894; 10 miles north of Laurinburg, Scotland County, *Godfrey*, no. 5430; between Blowing Rock and Lenoir, Wautaga County, *A. B. Seymour*, no. 65; between Gold Hill and Falls of the Yadkin, Stanley County, *Small & Heller*. SOUTH CAROLINA: west of McBee, Chesterfield County, *Godfrey*, no. 8076; 14 miles south of Columbia, Lexington County, *Godfrey & Tryon*, no. 1302; Caesar's Head, Greenville County, *J. D. Smith*. GEORGIA: Athens, Clarke County, *Wiegand & Manning*, no. 3192; Augusta, ex herb. *Thurber;* north of Quitman, Brooks County, *Harper*, no. 1619. FLORIDA: Live Oak, Suwanee County, *Curtiss*, no. 6939; ? St. Marks, Wakulla County, *Rugel*, no. 484. ALABAMA: southwest of Booth, Autaga County, *Harper*, no. 3265; east of Notasula, Macon County, *Wiegand & Manning*, no. 3191; 16 miles south of Dothan, Houston County, *Wiegand & Manning*, no. 3190; Tensaw, Baldwin County, *Tracy*, no. 8022; west of Mobile, Mobile County, *Harper*. MISSISSIPPI: Ocean Springs, Jackson County, *Seymour & Earle*, no. 91821.43; Biloxi, Harrison County, *Tracy*, no. 4337. PLATE 742, FIG. 3; MAP 1.

As contrasted with *Chrysopsis nervosa* and its varieties, the only other species of Virginia, *C. graminifolia* shows a pronounced preference for the Piedmont region. As pointed out in an earlier paper we have not found it on the outer coastal sands; nor does it occur in the most sterile pine barrens of the state.

2. C. MICROCEPHALA Small, Fl. Se. U. S. 1182 and 1339 (1903). *Pityopsis microcephala* (Small) Small, Man. Se. Fl. 1341 (1933).—Sandy pineland and sand hills, Florida to eastern Texas, north to southeastern North Carolina, northeastern South Carolina, southern Arkansas and southeastern Oklahoma. The following are characteristic. NORTH CAROLINA: near Southport, Brunswick County, *Godfrey & Shunk*, no. 4141. SOUTH CAROLINA: Hartsville, Darlington County, *Eggleston*, no. 4936; west of Salters, Williamsburg County, *Godfrey & Tryon*, no. 511 (with unusually large and subglabrate involucre, presumably from growing in a drainage-ditch); Santee Canal, Berkeley County, *Ravenel;* west of Bonneau, Berkeley County, *Godfrey & Tryon*, no. 1618; west of Jamestown, Berkeley County, *Godfrey*, no. 8175. GEORGIA: Folkston, Charlton County, *Francis Harper*, no. 668 (as *Aster*). FLORIDA: Jacksonville, Duval County, *Curtiss*, no. 5319 (ISOTYPE); Lake City, Columbia County, *Nash*, no. 2492 (very narrow-leaved); Starks, Volusia County, *Grace Gilbert;* Homestead, Dade County, *Small, DeWinkler & Mosier*, no. 11,162; Marcs, Lee County, *Hitchcock*, No. 138 (slender-leaved). ALABAMA: Gateswood, *Tracy*, no. 8566. ARKANSAS: near Malvern, Hot Springs County, *E. J. Palmer*, no. 29,579. OKLAHOMA: Page, LeFlore County, *G. W. Stevens*, no. 2623. TEXAS: Houston, *E. J. Palmer*, no. 12,727. PLATE 741, FIG. 3; MAP 2; a southern Coastal Plain species.

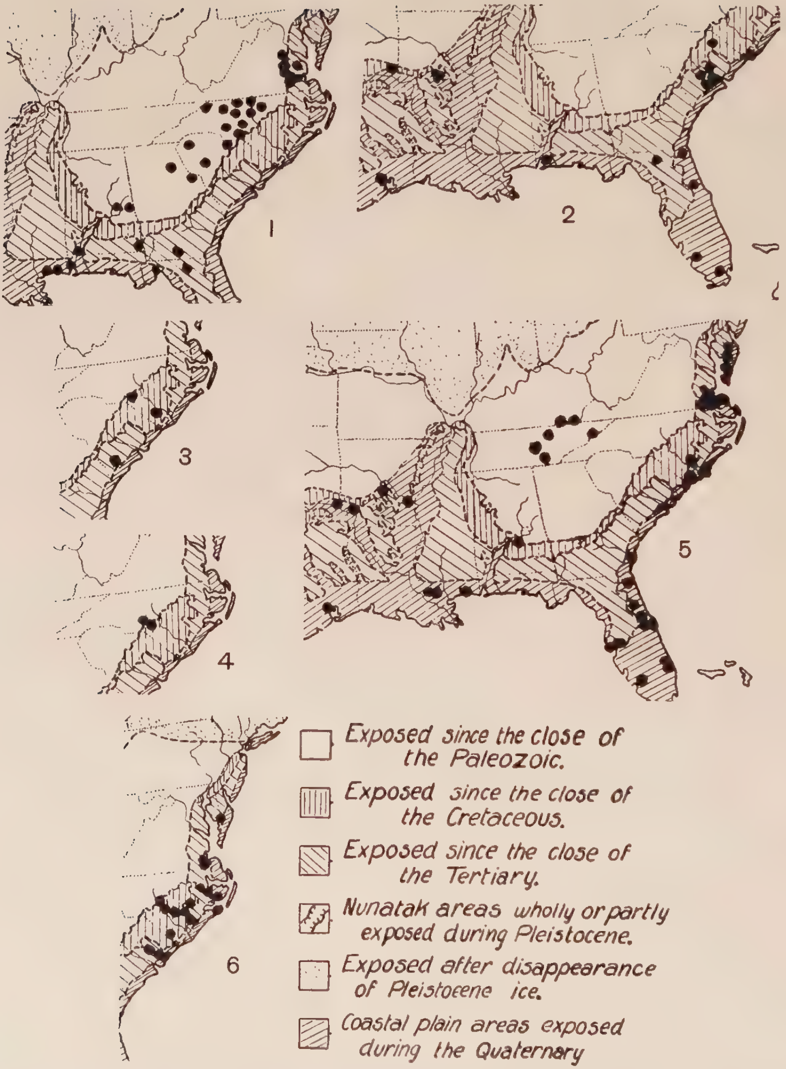
3. C. **Correllii,** sp. nov. (TAB. 741, FIG. 1 et 2). Perennis subcespitosa; foliis radicalibus confertis erectis lineari-lanceolatis elongatis argenteo-sericeis; caulibus 1–4 rigidis scopiformibus 3–7.5 dm. altis argenteo-sericeis; foliis caulinis adpressis; paniculis rigidis corymbiformibus ramis valde adscendentibus; pedunculis imbricato-foliaceis, precosioribus ramulis elongatis capitula immatura gerentibus valde superatis; involucro turbinato 8–13 mm. longo basi sparse lanato, phyllaribus valde imbricatis herbaceis viscidis anguste lineari-attenuatis, majoribus 0.5–0.8 mm. latis; ligulis luteis; pappo sordido.—Southeastern North Carolina and southeastern South Carolina. NORTH CAROLINA: sandy region at White Lake, Bladen County, July 15, 1935, *Correll*, no. 2577 (TYPE in Herb. Gray.); White Lake, August 14, 1938, *Godfrey*, no. 5985; moist rich soil along Drowning Creek, near Wagram, Scotland County, June 18, 1935, *Correll*, no. 1168. SOUTH CAROLINA: sandy bank, 8 miles south of Hendersonville, Colleton County, July 19, 1927, *Wiegand & Manning*, no. 3186. MAP 3.

Chrysopsis Correllii is a very early-flowering species, beginning to flower in mid-June. The type (PL. 741, FIG. 1), with only a few fully developed heads and many erect broom-like branchlets with incipient heads, is as far along (July 15) as Godfrey's material of August 14 from the same locality. Correll's other number, collected June 18, is essentially as mature. When the heads terminating the erect lateral branchlets come to anthesis the central heads would doubtless be over-ripe. Although the herbaceous phyllaries are not stipitate-glandular they are so viscid as to adhere closely to the pressing paper. The species seems to be a very local one. It is a great pleasure to associate with it the name of DONOVAN STEWART CORRELL, who has so extensively explored the flora of the Carolinas.

4. C. **adenolepis** sp. nov. (TAB. 742, FIG. 1 et 2). Planta valde stolonifera, stolonibus flagelliformibus bracteoliferis elongatis; foliis imis lineari-lanceolatis prolongatis argenteo-sericeis vel sublanatis, superioribus valde reductis; caule erecto sericeo 4–4.5 dm. alto corymbiformi-paniculato; pedunculis filiformibus stipitato-glandulosis remote bracteolatis; involucris turbinatis 8–10 mm. altis, phyllaribus multi-seriatis linearibus vel anguste lineari-lanceolatis glabris dorso viridibus margine scarioso-chartaceis, exterioribus dorso stipitato-glandulosis; ligulis flavis; pappo sordido-rufescenti.—Moore County, NORTH CAROLINA. old barren fields, Pinehurst, August 19, 1897, *Otto Katzenstein* (TYPE in Herb. Gray.); sandy roadside, near West End, June 30, 1927, *Wiegand & Manning*, no. 3185.

In its glandular involucre at once suggesting *C. graminifolia* of which, when understood, it may prove to be an extreme variation. The flagelliform stolons, the only minutely glandular peduncles and the very slender phyllaries seem to distinguish it. The development or failure to develop flagelliform stolons is so general a character through large and consistent series of specimens that I am giving it much weight in separating *C. adenolepis*. MAP 4.

5. C. **nervosa** (Willd.), comb. nov. *Erigeron nervosum* Willd. Sp. Pl. iii^3. 1953 (1803). *Inula argentea* Pers. Syn. ii. 452 (1806); Nutt. Gen. ii. 151 (1818). *C. argentea* (Pers.) Ell. Sk. ii. 334 (1824); DC. Prodr. v. 326 (1836). *Pityopsis argentea* (Pers.) Nutt. in Trans. Am. Phil. Soc. n. s. vii. 318 (1841). *C. graminifolia* sensu most recent auth., not (Michx.) Ell.—Bearing elongate flagelliform basal stolons; stems 1–4, 0.15–1.2 m. high; panicle open, with elongate slender branches (rarely with only


1
2
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6
Exposed since the close of the Paleozoic.
Exposed since the close of the Cretaceous.
Exposed since the close of the Tertiary.
Nunatak areas wholly or partly exposed during Pleistocene.
Exposed after disappearance of Pleistocene ice.
Coastal plain areas exposed during the Quaternary

Map 1, Range of Chrysopsis graminifolia; map 2, of C. microcephala; map 3, of C. Correllii; map 4, of C. adenolepis; map 5, of C. nervosa; map 6, of C. nervosa, var. stenolepis.

1–few heads); involucre 8–13 mm. high, silky-pilose to -lanate, without stipitate glands, the short outer phyllaries passing insensibly into the crowded or imbricated silky upper bracts of the peduncles; the longer scario-chartaceous phyllaries linear to linear-lanceolate or narrowly oblong, 1–1.4 mm. broad.—Dry to moist sandy pine or oak woods, thickets, ridges or openings, or siliceous rock in the interior, Coastal Plain from Florida to eastern Texas, north to southern Delaware, central Arkansas and southeastern Oklahoma; Pine Mountain, southeastern Kentucky, and Cumberland Plateau to Great Smoky Mountains, Tennessee. The following, from a large representation, are representative. DELAWARE: near Terrapin Hill, southwest of Laurel, August 5, 1874, *A. Commons* (although Persoon's *Inula argentea* was said to have come from Pennsylvania and an old specimen in the Gray Herbarium bears in the hand of Elias Durand the data "N. Jersey", I find no authentic record of the plant from north of southern Delaware). MARYLAND: Salisbury, October 3, 1863, *Canby*, with the note: "To show the runners" (more than 3 dm. long). VIRGINIA: Old Town Neck, Northampton County, *Fernald, Long & Fogg*, no. 5503; west of Kiptopeke, Northampton County, *Fernald, Long & Fogg*, no. 5504; Cape Henry, Princess Anne County, *Tidestrom*, no. 3065, *Killip*, no. 6750; Virginia Beach, Princess Anne County, *K. K. Mackenzie*, no. 1729, *Fernald & Griscom*, no. 2913; near Franklin in Isle of Wight County, *Heller*, no. 1122; south of Factory Hill, Nansemond County, *Fernald & Long*, no. 6884; Nottoway Swamp, west of Franklin, Southampton County, *Fernald & Long*, no. 9636; Point Beach, south of Franklin, *Fernald & Long*, no. 11,457. NORTH CAROLINA: 5 miles west of Clinton, Sampson County, *Godfrey*, no. 4525; Carolina Beach, New Hanover County, *Godfrey*, no. 4671; Old Dock, Columbus County, *Godfrey & Shunk*, no. 4179. GEORGIA: Blackbeard Island, *McAtee*, no. 3331. FLORIDA: near Jacksonville, *Curtiss*, no. 1359; DeLand, Volusia County, *G. D. Hurst;* Orlando, February, 1889, *Canby:* Okeechobee region, Brevard County, *Fredholm*, no. 6338; Earman, Palm Beach County, *F. R. Randolph*, no. 59; west of Jupiter, Palm Beach County, March 15, 1924, *Harper;* St. Petersburg, *Mrs. Chas. C. Deam*, no. 2909; Hillsborough County, *Fredholm*, nos. 6481 and 6492; Fort Myers, *J. P. Standley*, nos. 27 and 87. KENTUCKY: Pine Mountain, Bell County, *Kearney*, no. 405; Pine Knot, McCreary County, *H. J. Rogers*, no. 85. TENNESSEE: at 2300 ft. alt., Rugby, Morgan County, *Svenson*, no. 4096; at 2300 ft. alt., 8 miles east of Crossville, Cumberland County, *Svenson*, no. 4147; Wolf Creek, Cocke County, *W. A. Anderson*, no. 1115; Hiwassee Valley, *Ruth*, no. 27. ALABAMA: northeast of Autaugaville, Autauga County, *Harper*, no. 3270. MISSISSIPPI: Biloxi, *Tracy*, no. 6444. ARKANSAS: Rose Bud, White County, *Demaree*, no. 10,918; Pulaski Heights, Little Rock, *Demaree*, no. 8148; Blue Mountain, Pulaski County, *Demaree*, no. 8808; Counterfit Hollow, northwest of Murfreesboro, Pike County, *Demaree*, no. 9761. Louisiana: vicinity of Covington, *Arsène*, no. 11,431; southwest of Hammond, Tangipahoa Parish, *D. S. & H. B. Correll*, no. 9268. Oklahoma: Broken Bow, McCurtain County, *Hopkins & Van Valkenburgh*, no. 6146. Texas: presumably near Houston, *Lindheimer*, no. 89. Plate 743, fig. 3 and pl. 744, fig. 3; map 5.

*Var. **virgata,** var. nov. (tab. 744, fig. 1 et 2), paniculis anguste cylindrico-thyrsiformibus ramis erectis valde abbreviatis. Virginia: vicinity of Norfolk, autumn of 1906, *M. C. Jensen;* dry open sandy soil northwest of Magnolia, Nansemond County, October 17, 1941, *Fernald & Long*, no. 14,036 (type in Herb. Gray.; isotype in Herb. Phil. Acad.). See p. 371.

*Var. **stenolepis,** var. nov. (tab. 743, fig. 1 et 2), var. typicae similis, phyllaribus longioribus anguste linearibus 0.6–1 mm. latis valde herbaceis margine angusto scarioso exceptis.—Pinelands and pine barrens, eastern Maryland to South Carolina. Maryland: open pine woods along Tonytank Creek, 2½ miles south of Salisbury, September 8, 1938, *R. R. Tatnall*, no. 3971 (transitional). Virginia: dry sandy pine barrens south of Zuni, Isle of Wight County, August 24, 1936, *Fernald & Long*, no. 6710; white sand of dry pine barrens, south of Lee's Mill, Isle of Wight County, August 23 and September 2, 1940, *Fernald & Long*, no. 12,860; sandy and peaty pine barrens, east of Cox Landing, south of South Quay, Nansemond County, September 15 and 22, 1939, *Fernald & Long*, no. 11,456. North Carolina: pine woodland, McCullen, Wake County, July 12, 1938, *Godfrey*, no. 4950; pineland, Chocowinty, Beaufort County, July 20, 1938, *Godfrey*, no. 5410; dry sand, Snow Hill, Greene County, July 8, 1922, *L. F. & F. R. Randolph*, no. 756; sand ridge near Goldsboro, Wayne County, September 3, 1938, *Godfrey*, no. 6555; low pineland, Dunn, Hartnett County, August 25, 1938, *Godfrey*, no. 6126; pineland near Lilington, Hartnett County, August 5, 1938, *Godfrey* no. 5638; pineland at Fort Barnwell, Craven County, October 13, 1938, *Godfrey & White*, no. 6832; pineland, Grantsboro, Pamlico County, October 13, 1938, *Godfrey & White*, no. 6828; open woodland, Olympia, Pamlico County, July 12, 1922, *L. F. & F. R. Randolph*, no. 910 (type in Herb. Gray.); pineland near Atlantic, Cartaret County, September 1, 1938, *Godfrey*, no. 6421; open pinelands, Jacksonville, Onslow County, July 20, 1922, *L. F. & F. R. Randolph*, no. 995; pineland near Hallsboro, Columbus County, August 29, 1938, *Godfrey*, no. 6286. South Carolina: excavated, coarse white sandy pockets in pine barrens, 5 miles south of Kingstree, Williamsburg County, August 23, 1939, *Godfrey & Tryon*, no.

1647 (phyllaries unusually blunt); grass-sedge bog or savannah, 12 miles north of Georgetown, June 23–24, 1939, *Godfrey & Tryon*, no. 106; burned-over savannah, 5 miles south of Andrews, Georgetown County, August 11, 1939, *Godfrey & Tryon*, nos. 1372 and 1378. Map 6.

Var. *stenolepis*, although habitally inseparable from typical *Chrysopsis nervosa*, seems to be a fairly marked variety of pinelands chiefly of southeastern Virginia and the Carolinas. Var. *virgata*, known only from a limited area in southeastern Virginia, within the range of typical *C. nervosa*, may prove to be only a vegetative form. Typical *C. nervosa*, with one area at high altitude on the Appalachian Upland, the other following much of the Coastal Plain, illustrates the large group of species which, presumably, has retained a foothold on the old core of the continent, where, except in highly silicious soils, conditions are less favorable for them than on the younger sands of the Coastal Plain. It is strongly contrasted with *C. graminifolia*, which has its great development on the Piedmont east of the Alleghenies and on the inner Coastal Plain. It is not wholly satisfactory to keep *C. Tracyi* Small specifically apart from *C. nervosa*. Until the Floridan series is more thoroughly studied I am leaving them apart, as I am an unidentified plant of Florida with stiff branches often overtopping the inflorescences.

In plate 741, figs. 1 and 2 are of Chrysopsis Correllii: fig. 1, type × 2/5; fig. 2, head, × 4. Fig. 3, head, × 4, of C. microcephala, from isotype. Plate 742, figs. 1 and 2, C. adenolepis, from type: fig. 1, plant, × 2/5; fig. 2, head, × 4. Fig. 3, head, × 4, of C. graminifolia from near Bowling Green, Virginia, *Fernald & Long*, no. 9174. Plate 743, C. nervosa, var. stenolepis: fig. 1, portion of small plant, × 1, from east of Cox Landing, south of South Quay, Virginia, *Fernald & Long*, no. 11,456; fig. 2, head, × 4, from the type. Fig. 3, inflorescence, × 1, of 2-headed plant of C. nervosa, from Old Town Neck, Northampton County, Virginia, *Fernald, Long & Fogg*, no. 5503. Plate 744, figs. 1 and 2, C. nervosa, var. virgata, from the type: fig. 1, plant, × 1/3; fig. 2, head, × 4. Fig. 3, head, × 4, of typical *C.* nervosa from near Factory Hill, Virginia, *Fernald & Long*, no. 6884.

Solidago bicolor L., var. ovalis Farwell. To the recorded stations add others. Isle of Wight County: seeping calcareous wooded bluffs by James River, west of old Fort Boykin, no. 13,175. Greensville County: wooded bottomland of Nottoway River below Double Bridge, north of Orion, no. 13,802.

S. arguta Ait. On the calcareous bluffs along the lower James, west of old Fort Boykin, this and other species reach phenomenal size, our no. 13,176 having basal leaves up to 3.4 dm. long and 1 dm. broad, no. 13,804 being 2 m. high, with panicle-branches nearly 5 dm. long. See p. 345.

S. perlonga Fern. Range extended 25 miles inland to southwestern Dinwiddie County: very abundant in open argillaceous low woods just east of McKenney, no. 14,042. See p. 373.

S. Elliottii T. & G. Add stations in Norfolk County: in dense cane (*Arundinaria*) scrub, north of Cornland, nos. 14,039 and 14,040.

S. fistulosa Mill. Thickets of this species along the Feeder Ditch from Lake Drummond, Norfolk County, reach a height of 2.25 m., no. 13,836.

Boltonia asteroides, var. glastifolia (Hill) Fern. Frequent on tidal marshes and shores of Chickahominy River to head of tide in New Kent and Charles City Counties, sometimes up to 1.6 m. high, the ligules white or lilac (many nos.). See p. 357.

Aster grandiflorus L. Range extended inland to southwestern Dinwiddie County: open argillaceous low woods just east of McKenney, no. 14,051.

*A. racemosus Ell. Norfolk County: dry open ground east of Cedarville, no. 14,052; the first from north of South Carolina. See p. 369.

A. pilosus Willd., var. demotus Blake. On the sand-beach of James River, Claremont, becoming shrubby, the new flowering branches of the year arising from among the old fruiting branches of the preceding year (no. 13,820). See p. 363.

*A. Elliottii T. & G. Range extended north into Princess Anne County: reed-marsh along Blackwater River, southwest of Pungo Ferry, no. 14,054—ligules rosy-pink. See p. 370.

Erigeron pulchellus Michx. Local range extended into Nansemond County: forming extensive carpets in dry sandy woods above Nansemond River, east of Cahoon Pond, northwest of Suffolk, no. 13,481.

*Pluchea purpurascens (Sw.) DC., var. succulenta Fernald in Rhodora, xliv. 227 (1942), forma **obovata,** f. nov., foliis late obovatis basi subcuneatis apice rotundatis emarginatisve.—Virginia: tidal marsh along Powhatan Creek, north of Jamestown Island, James City County, August 22, 1939, *Fernald & Long*, no. 11,191 (type in Herb. Gray.).

An extraordinary form, with broadly obovate leaves strongly rounded to emarginate at summit, typical var. *succulenta* having the rhombic- to oblong-ovate leaves tapering to tip.

Helianthus angustifolius L. Range extended inland to southwestern Dinwiddie County: open argillaceous low woods just east of McKenney, no. 14,058. See p. 373.

*Coreopsis oniscicarpa Fernald, var. **simulans,** var. nov., foliis radicalibus late oblanceolatis vel subellipticis 1.2–2 cm. latis; phyllaribus externis deltoideo-ovatis margine albidohyalinis ad 5 mm. longis et 2 mm. latis, phyllaribus internis pallide brunneis; ligulis 0.6–1.2 cm. longis.—Nansemond County, VIRGINIA: sandy ditch at border of low woods northeast of Baines Hill School, September 12, 1941, *Fernald & Long*, no. 13,827 (TYPE in Herb. Gray.; ISOTYPE in Herb. Phil. Acad.), October 16, 1941, no. 14,061 (fruit from same colony). See pp. 368 and 371.

Typical *Coreopsis oniscicarpa* Fernald in RHODORA, xl. 472, pl. 533 and 534, figs. 1, 5 and 8 (1938) has the narrowly oblanceolate basal leaf-blades only 0.5–1 cm. broad; the outer phyllaries deltoid-lanceolate to lance-oblong, only 0.7–3 mm. long and less whitened at the margins; the inner phyllaries dark brown to fuscous; the ligules 0.8–1.8 cm. long. Var. *simulans* has broader basal leaves (1.2–2 cm. broad); the outer phyllaries deltoid-ovate, prominently pale-margined, and mostly 3–5 mm. long; the inner phyllaries pale brown; and the ligules constantly short (only 0.6–1.2 cm. long). Its achenes are in no way different from those of typical *C. oniscicarpa.* The varietal name is given because, in the broad basal leaves and in the shape of the outer phyllaries, var. *simulans* slightly suggests the more southern *C. linifolia* Nutt.—see Fernald in RHODORA, xlii. 496, 497, pl. 649 (1940). In that species of the extreme South, however, the outer phyllaries are round-ovate (in *C. oniscicarpa*, var. *simulans* deltoid), the inner ones (as well as the outer) with pale margins; the ligules 1.3–2.5 cm. long (in var. *simulans* 0.6–1.2 cm.); and the bodies of the achenes 2.5–3.2 mm. long and 1–1.2 mm. broad. In the more northern *C. oniscicarpa* and its var. *simulans* they are 1.8–2.2 mm. long and 0.6–0.9 mm. broad. Although simulating *C. linifolia*, the new *C. oniscicarpa* var. *simulans* clearly belongs with the latter species.

*COREOPSIS TINCTORIA Nutt., forma **atropurpurea** (Hook.), stat. nov. Var. *atropurpurea* Hook. Bot. Mag. lxiii., t. 3511 (1836). SOUTHAMPTON COUNTY: roadside bank, south of Franklin, no. 13,186.

*BIDENS CORONATA L., var. BRACHYODONTA Fernald. NEW KENT COUNTY: fresh tidal marsh of Pamunkey River, south of White House, no. 11,635. PRINCESS ANNE COUNTY: reed-marsh along Blackwater River, southwest of Pungo Ferry, no. 14,066. NORFOLK COUNTY: damp old clearings and thickets, eastern side of Great Dismal Swamp, north of Wallaceton, nos. 13,829, 13,830 and 14,064.—Extension south from Delaware. See pp. 366 and 371.

*Cosmos bipinnatus Cav. The commonly cultivated species, frequently seen on dumps and in waste ground. In dry sandy woods north of Orion, Greensville County, apparently naturalized, some large plants with the expanded heads 5–6 cm. broad, others, in poorer soil, with them only 2–3 cm. across (nos. 14,062 and 14,063).

Senecio obovatus Muhl. Range extended down the James to Isle of Wight County: seeping calcareous wooded bluffs west of old Fort Boykin, no. 13,187. See p. 345.

Cirsium virginianum (L.) Michx. Range extended inland to southwestern Dinwiddie County: open argillaceous low woods just east of McKenney, no. 14,070. See p. 373.

*Sonchus oleraceus L., forma lacerus (Willd.) G. Beck. James City County: calcareous fossiliferous bluff by James River, Grove Landing, southeast of Grove, no. 13,488; a relatively rare form in America.

*S. asper (L.) Mill., forma inermis (Bisch.) G. Beck. Isle of Wight County: with typical *S. asper* on dry calcareous bluff by Burwell's Bay, James River, at Bailey's Beach, near Rushmere, no. 13,188.

*Lactuca canadensis L., var. obovata Wieg., forma Steelei (Britton) Fernald in Rhodora, xl. 481 (1938). *L. Steelei* Britton. Range extended south to King William County: border of sandy oak woods southwest of Aylett, no. 13,489.

*Prenanthes serpentaria Pursh, forma **simplicifolia,** f. nov., foliis oblongis vel elliptico-lanceolatis.—Virginia: rich woods and bushy clearing just east of the "fall-line" along Nottoway River, Double Bridge, about 6 miles northwest of Jarratt, Sussex County, September 21, 1939, *Fernald & Long*, no. 11,485 (type in Herb. Gray.; isotype in Herb. Phil. Acad.); Bedford County, October 6, 1871, *A. H. Curtiss*.

Prenanthes serpentaria is ordinarily the most stable species of our flora in its foliage. Typically the lower and median leaves are of an ovate outline and deeply lobulate, whereas the foliage of *P. trifoliolata* (Cass.) Fernald and *P. altissima* L. is variable without seeming limit. Forma *simplicifolia* is, therefore, a noteworthy departure from typical *P. serpentaria*. It is possible that it may be *Nabalus integrifolius* Cass., basis of *N. Fraseri*, var. *integrifolius* (Cass.) Torr. & Gray. Without close study of Cassini's type it would be unsafe to guess, since Torrey & Gray and, after them, Gray did not distinguish *P. serpentaria* and *Nabalus Fraseri* from the polymorphic northern *P. trifoliolata* (Cass.) Fernald, which sometimes has unlobed leaves.

SCIRPUS **koilolepis,** comb. nov.—This little plant of our southern states was apparently first made known to science by Torrey in 1836, under the name *Isolepis carinata* Hook. & Arn. Steudel, ignorant of Torrey's name, later described it as *Isolepis koïlolepis,* basing his species on the same collection of Drummond which Torrey had seen. Gray and a year later Boeckeler independently transferred the species to *Scirpus* and it has since appeared in American literature as *S. carinatus* (Hook. & Arn.) Gray. It seems to have been generally overlooked that Smith used the binomial *Scirpus carinatus,* with illustrations, for a very different plant in several works and several editions in England over a long period of years prior to 1836. Since *S. carinatus* is obviously a homonym, as indicated by Mohr as early as 1901, another specific epithet is required and the need is apparently satisfied by Steudel's name. The transfer is hereby made. Purists noting the original spelling *koilolepes* will find that this typographical error was corrected by Steudel in his index.

SCIRPUS **koilolepis** (Steud.) Gleason, comb. nov. *Isolepis carinata* Hook. & Arn.; Torr. Ann. Lyc. N. Y. 3: 349. 1836. *Isolepis koilolepis* Steud. Syn. Cyp. 318. 1855. *Scirpus carinatus* Gray, Proc. Am. Acad. 7: 392. 1868. Homonym of *S. carinatus* Sm.; Sowerby, Engl. Fl. 28: pl. 1983. 1809.—H. A. GLEASON, New York Botanical Garden.

TRANSFERS IN SCIRPUS § ACTAEOGETON

M. L. FERNALD

SCIRPUS **Purshianus,** nom. nov. *S. debilis* Pursh, Fl. Am. Sept. i. 55 (1814), not Lam. (1791).

S. PURSHIANUS, forma **Williamsii** (Fernald), stat. nov. *S. debilis,* var. *Williamsii* Fernald in RHODORA, iii. 252 (1901). *S. Smithii,* var. *Williamsii* (Fernald) Beetle in Am. Journ. Bot. xxix. 655 (1942), as to type, not as to other specimens cited, which belong in part to typical *S. Purshianus,* in part to *S. Smithii,* forma *setosus.*

S. SMITHII Gray, forma **setosus** (Fern.), stat. nov. *S. Smithii,* var. *setosus* Fernald in RHODORA, iii. 252 (1901).

S. SMITHII, forma **levisetus** (Fassett), stat. nov. Var. *levisetus* Fassett in RHODORA, xxv. 42 (1921).

As pointed out by Beetle in his *Studies of the Genus Scirpus L. V. Notes on the Section Actaeogeton* in Am. Journ. Bot. xxix. 655

(1942), the well known annual species, *S. debilis* Pursh, is antedated by Lamarck's wholly different species of the same name. Although Beetle reduces Pursh's species to varietal rank under *S. Smithii* Gray, it is very doubtful if botanists who understand the two plants will at all subscribe to the uniting of the two. Those who have really understood our eastern species of *Cyperaceae,* conservative men like the late Asa Gray, Charles E. Smith, Witmer Stone, Ezra Brainerd and K. M. Wiegand, to mention only a few, clearly recognized them as distinct; and all living botanists who accurately know living plants in the field find them abundantly distinct. From his account of the two, as *S. Smithii* and *S. Smithii,* var. *Williamsii* (*S. debilis* Pursh), it is clear that Dr. Beetle has missed the significant characters and there is no indication from his citation of specimens that he has studied them in the field. His key to the two is as follows:

"Achene sharply trigonous.
  Achene obscurely roughened.
    Involucral bract strictly erect, ½ to ⅔
      length of plant......................5. *S. fistulosus* [African]
    Involucral bract often divergent or
      incurved, not more than ¼ length of plant.
      Culms rigid, yellow-green, spikelets 1-many;
        upper sheaths bladeless..............11. *S. smithii* var. *williamsii*
      Culms flaccid, dull green; spikelets 1–3;
        upper sheaths blade-bearing................10. *S. smithii*"

Although *S. Smithii* can be reached in this key only through "Achene sharply trigonous", the fuller description of the species definitely and correctly says "style 2-fid; achene . . . plano-convex" and then adds "or obscurely trigonous". The "trigonous" quality is most difficult to find in any real *S. Smithii* and, surely, it is difficult to understand how an ovary with "style 2-fid" can develop into an "Achene sharply trigonous." I have worked with *Cyperaceae* for more than fifty years and never met such a case. The term plano-convex, regularly used in describing the achene of *S. Smithii* is correct; the shining black and cuneate-obovate achene is flat on one face, gently convex on the other. As to the involucre of *S. Smithii,* no one could properly reach that species if he looked for a divergent or appreciably incurved bract "not more than ¼ length of plant"; for the bract, as correctly described by Asa Gray, who understood his own species, is "always erect", or it is at most inconspicuously arched at the subacute tip and in all well developed specimens it is ½ to ⅓, instead of "not more than ¼ length of plant", although exceptionally shorter. When Gray separated *S. Smithii* from *S. debilis* Pursh, the new species "Named for C. E. Smith, who indicated and insisted on its distinctions", he noted the upper sheath "often leaf-bearing". This is made by Beetle a definite character, but fuller and more recent material shows that the upper sheath may be bladeless in *S. Smithii* or with blades in *S. Purshianus* (*S. debilis* Pursh). Gray's original material of *S. Smithii* had only "1–3 . . . acute spikes", as against "3–12 . . . obtuse" ones in *S. debilis;* but further material shows that, although conically acutish, they may be as many as 9. There is no magic in the "1–3" relied upon by Beetle, who saw specimens in the Gray Herbarium which he borrowed and re-labeled, with thrice that number. Beetle reasons that the divergence of the short and round-tipped bract in *S. Purshianus* (*S. debilis*) is "merely a forcing back due to the position of the fourth spikelet". If that is all there is to it, why do the plants of *S. Smithii* with 4–9 spikelets have erect bracts; why is the bract much longer in proportion to the height of the culm than in *S. Purshianus;* why are the tips of bracts and basal blades in *S. Smithii* acutish, those of *S. Purshianus* rounded and callous; why is the culm of the latter obtusely trigonous and with concave sides, while in *S. Smithii* it is subterete, with rounded sides; why are the spikelets of *S. Purshianus* blunt, those of *S. Smithii* more acutish; why are the scales of the former roundish-ovate, becoming brown on the sides, while those of *S. Smithii* are oblong-ovate and greener or paler brown; why are the bristles (when present) in *S. Purshianus* coarse and coarsely retrorse-barbed, while, when developed, in *S. Smithii* they are strikingly delicate; why are the olivaceous to brown or dull black achenes of *S. Purshianus* round-obovoid and bulged on both faces, while in *S. Smithii* they are cuneate-obovate, shining black, and flat on one face, only slightly curved on the other? The answer is clear to those who have long known the two in the field. It is simply because they are distinct species.

Although Beetle says (his p. 655) that "Apparently *S. smithii* is no more than an aquatic extreme of *S. debilis* . . . [which] never has more than three spikelets", there is nothing in the habitats of the two to support this assumption. The type-locality of *S. Smithii*, to be sure, was on tidal shores of the Delaware, and elsewhere along the coast *S. Smithii* may occur on tidal shores, where at high tide it is temporarily drowned; but it is found on many shores which have had no pronounced tidal margins since the Champlain Subsidence, Lake Champlain and Lake Ontario, for instance, and on many inland small ponds of New England, New York, Indiana, Illinois and Minnesota, where the plants are never drowned by high tide. Asa Gray, with three collections of *S. Smithii*, clearly understood and defined the species. An accumulation of later material from scores of additional stations by field-botanists who have understood the plants has fully justified his differentiation of it.

As to the implication that *Scirpus Purshianus* (*S. debilis* Pursh) is a plant of drier habitats than *S. Smithii* (if the latter is "no more than an aquatic state" of the former) it may further be noted that plenty of accurate labels by the collectors indicate sometimes a pretty paludal to subaquatic habitat for the former ("bog-pond", "bed of Merrimack River", "wet meadow", "in and around sphagnous upland swamps", "bed of Shavers Fork", "Caricaceous marsh", etc.); while plenty of inland stations for *S. Smithii* are recorded thus: "sandy shore", "sand-flats", "sandy beach", "alluvial soil", "sand dunes" and in one case "ledges". *S. Smithii*, besides growing on sandy, muddy or mucky shores inland, frequently grows in fresh tidal sands and mud; *S. debilis* is rarely if ever in the latter habitats. In this connection the note by Wiegand & Eames in their Flora of the Cayuga Lake Basin, 98 (1926) is suggestive. In that area only typical *S. Smithii* is found, on "Sandy shores", but the authors say, "Probably influenced in its local occurrence by the well-known brackish conditions about Cayuga Lake".

Scirpus Purshianus of acid soils is a southern species, found from Georgia and Alabama northward to southwestern Maine, central New Hampshire, southern Vermont, southeastern New York, eastern Pennsylvania, West Virginia, southern Michigan, and Wisconsin. *S. Smithii*, chiefly of more basic soils, is northern, occurring from the estuary of the St. Lawrence, in Quebec, westward to Minnesota, and south to southern New England, the lower Delaware drainage of New Jersey, eastern Pennsylvania and Delaware, possibly northeastern Virginia, western New York, northwestern Pennsylvania, northern Ohio and northern Indiana. If it is "no more than an aquatic extreme" of the former why does its northeastern range extend nearly 200 miles beyond, its southern range stop 600 miles short of the limits of *S. Purshianus*?

The varieties proposed in the past seem better treated as forms; their differences are in the presence or absence of perianth-bristles, or in case of *S. Smithii*, forma *levisetus*, the lack of retrorse barbs on the bristles. They all occur as localized colonies within the broad range of the two species, the latter form, like the type of the species, in tidal flats, *S. Purshianus*, forma *Williamsii* as an extremely local plant within an area where typical *S. Purshianus* abounds.

Note on S. Hallii.—In the same paper Beetle treats our very characteristic and highly localized *Scirpus Hallii* Gray as a variety of "*S. uninodis* (Delile) Boiss." of Africa, although he says "Eurasia". Delile described it from Egypt, and Boissier, who did not consider it specifically different from the Eurasian *S. supinus* L., calling it *S. supinus*, γ *digynus*, knew it only from a single Egyptian collection. *S. uninodis* was invalidly published by Boissier as a synonym and falsely ascribed to Delile, who had placed it in *Isolepis: S. supinus*, "γ *digynus*.—Stylus bifidus, nucula orbicularis lenticulari-biconvexa transverse obsolete et praesertim versus margines rugulosus.—*S. uninodis* Del. Descr. Eg. p. 132 sub *Isolepide* tab. 6, fig. 1." The proper author of the combination, *S. uninodis*, if it has ever been validly published, I leave to those who have to use it. This may be a needless search, for *Isolepis uninodis* Delile was published in 1813, while *S. lateralis* Forsk. Fl. Aegypt.-Arab. 15 (1775) is cited by C. B. Clarke in Thiselton-Dyer, Fl. Trop. Afr. viii. 453 (1902), as identical with it. Clarke, however, calling the plant *S. supinus*, var. *uninodis* (Delile) C. B. Clarke, was basing his variety merely on habital characters, not upon the achenes, and his identification, therefore, needs careful checking.[1]

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[1] On the preceding page Clarke said, under *Scirpus supinus:* "The var. *Hallii* is frequent in North America". There are hundreds of botanists in North America who would like to find it "frequent"; it is perhaps the most infrequent member of the genus with us, famous and often cited as a relict species, with 1 station in Massachusetts, 1 in Georgia, 2 or 3 in Florida, 1 in Illinois, 1 in Texas.

The plant with plump-lenticular achenes is widely dispersed from Egypt to Senegal, but the Asiatic material which Beetle has marked *S. uninodis* in the Gray Herbarium has 3 styles and trigonous cuneate achenes. So far as I can find most critical students refer the Asiatic material to *S. supinus* L. Our *S. Hallii* with plano-convex and sharply and transversely ribbed achenes has little, except habit, in common with it. The African plant, as shown by Leprieur's material of it, has such different scales (almost uniformly colored, chartaceous and readily splitting under pressure) and such different achenes (much plumper than in ours and only obscurely cross-marked) that I am content to leave the plant of the United States as *S. Hallii* Gray. It would be almost if not quite unprecedented that an endemic plant of the United States should be a variation of an endemic of North Africa.

Beetle places *S. Hallii*, as *S. uninodis*, var. *Hallii*, under a division of his key with "Sheaths bladeless". Delile, in describing *Isolepis uninodis* said "Chaque chaume . . . terminée par une pointe courte foliacée"; and it is difficult to collect *S. Hallii* at its eastern Massachusetts station without getting blades up to 1 dm. long. Furthermore, in describing *S. Hallii* Gray correctly said "stems . . . sometimes 1-leaved above the middle", and the TYPE shows blades up to 1.5 dm. long. It is feared that in his treatment of the group the author of the recent study has relied more upon variable and inconstant vegetative characters than upon more stable and fundamental ones of the reproductive structures.

THE FERNS AND FERN ALLIES OF LOUISIANA.—Drs. Brown and Correll have recently given us an excellent treatment of the *Pteridophyta* of Louisiana.[1] The book is unusually complete and accurate and presents a wealth of detail. Each of the sixty-six species, varieties, forms and hybrids is amply described. The species are illustrated by half-tones and notes of special interest on distribution, ecology and history are freely included. The phytogeography of an unusual element of northern species that occurs in the state is discussed in detail. Among the ferns it is represented by *Adiantum pedatum*, *Diplazium acrostichoides* and *D. pycnocarpon*.

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[1] BROWN, C. A. AND CORRELL, D. S. The Ferns and Fern Allies of Louisiana. i–xii, 1–186. *f. 1–49*. Baton Rouge, Louisiana State University Press. July, 1942. $3.00.

The keys to the families, genera and species are well constructed and the contrasting characters have been carefully chosen. An ample glossary and bibliography are included. The authors have studied material in thirteen herbaria and the specimens upon which their study is based are cited. This puts the entire treatment on a firm basis of fact. It is an excellent example of how technical data can be added to a popular treatment without detracting from its value as a book that can be used by the layman.—R. M. TRYON, JR., Dartmouth College.

PENTSTEMON LAEVIGATUS A MISNOMER.—In determining the species of a *Pentstemon* collected early in July along a brook in a field below Pinkham Notch, New Hampshire, difficulty was experienced because of a discrepancy between the material and the descriptions in Gray's Manual. Although in all other respects the plants corresponded to *P. laevigatus* Ait. var. *Digitalis* (Sweet) Gray, they showed decussate lines of pubescence along the internodes, whereas the description of the species reads "glabrous to the inflorescence." The specific name in itself refuted this identification yet no other possibility appeared.

An examination of the material at the Gray Herbarium disclosed the fact that all the specimens that had ever been attributed to either *P. laevigatus* or the variety *Digitalis* have the same general type of pubescence as that observed in the Pinkham Notch material. Decussate lines of pubescence are always present in the two lowest internodes. These in many cases persist up to the inflorescence or to a node short of it, but are increasingly inconspicuous at each higher internode. In some specimens the hairs become diffuse on the higher internodes although the decussate distribution reappears close to the nodes.

Hence it appears that an oversight, which has persisted from the time of Aiton, resulted in the attribution of an inappropriate name to *P. laevigatus* and also in incorrect descriptions throughout the literature.—JEANNETTE E. GRAUSTEIN, Women's College, University of Delaware, Newark, Delaware.

Volume 44, no. 527, including pages 414–452 and plates 725–736, was issued 7 November, 1942.

ERRATA

Page 28, line 15; for *Pseudoëpostoa* read *Pseudoëspostoa.*
Page 35, line 8; for *Hely-* read *Heli-.*
Page 66, line 29; *for* GRACILE *read* GRACILIS.
Page 70, line 17; *for* huachacae *read* huachucae.
Page 70, line 43; *for* Melia *read* Melica.
Page 147, line 21; *for* Kuntz *read* Kuntze.
Page 255, line 32; for *mollisissima* read *mollissima.*
Page 255, line 35; for *mollisissimus* read *mollissimus.*
Page 284, line 30; *after* nov. ADD *C. cristata,*
Page 340, line 12; for *ramosus* [last word] read *ramosum.*
Plate 712, in caption, line 7; *for* OCCALTANS *read* OCCULTANS.
Plate 718, in caption, line 1; *after* leaf *add in each case* × 3/7.
Plate 718, in caption, line 2; *for* open; all *read* open,
Page 357, line 15; for *virginiana* read *virginica*
Plate 719, in caption, line 1; *after* leaf *add in each case* × 2/5.
Plate 719, in caption, line 2; *after* open *add*, × 1.
Plate 719, in caption, line 2; *for* fruit; all *read* fruit,
Page 401, line 29; *for* world-war. In *read* world-war, in.
Page 401, line 31; for *truncata* read *subtruncata.*
Page 407, line 11; *for* ODGEN *read* OGDEN.

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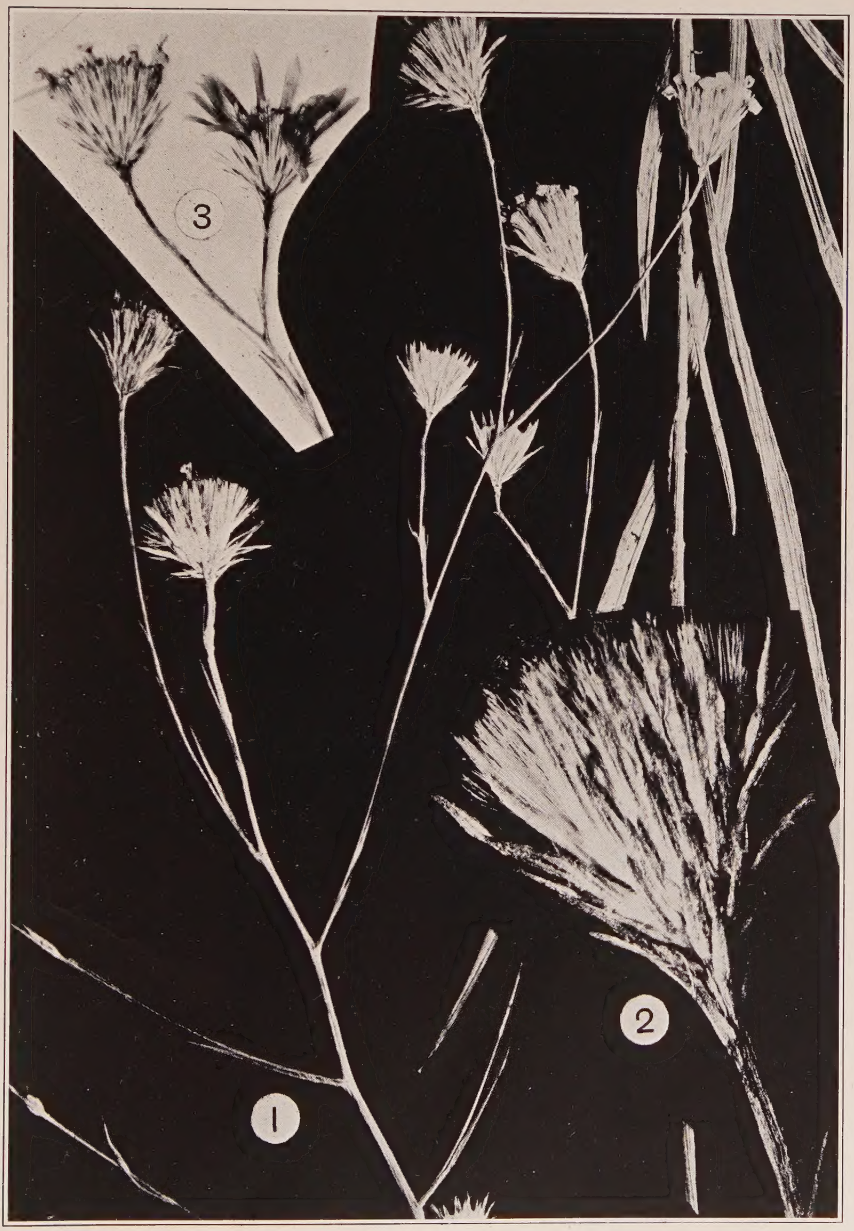

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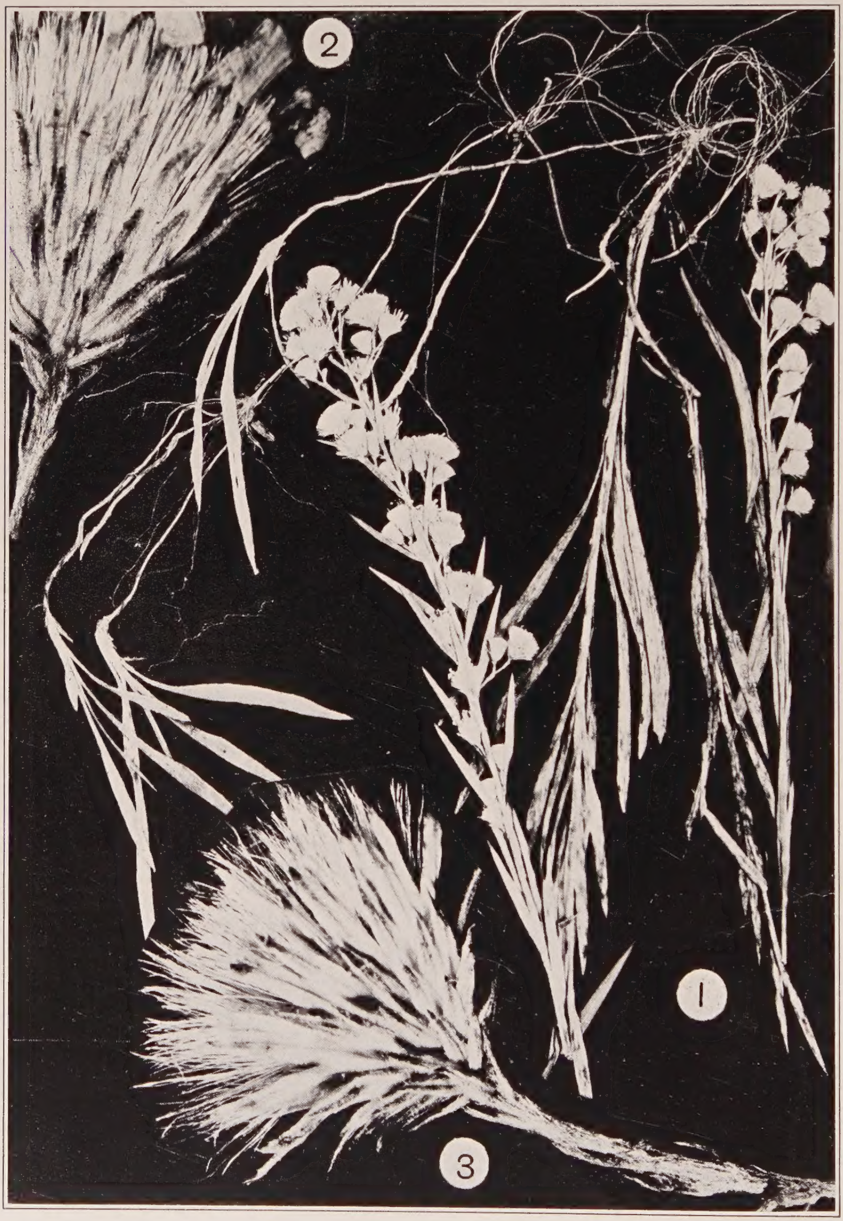
Chrysopsis nervosa: fig. 3, a small inflorescence, × 1. Var. stenolepis: fig. 1, portion of plant, × 1; fig. 2, head, × 4.



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CHRYSOPSIS NERVOSA: FIG. 3, head, × 4.
Var. VIRGATA: FIG. 1, TYPE, × ⅓; FIG. 2, head, × 4.

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